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An Assessment of Preservation Opportunities in the New Jersey Pine Barrens

Thomas James Wilson
University of Pennsylvania

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An Assessment of Preservation Opportunities in the New Jersey Pine Barrens

Abstract

The Pine Barrens of southern New Jersey is a 1.4 million acre expanse of dense forest that is one of the most unique ecological regions on the planet. From the late 17th century until the 1890's, a series of industries flourished deep within the Pine Barrens, forever altering the region's physical and cultural landscape. Of these industries, none had a greater impact on the region than the iron business. Although sites and ruins associated with the iron industry are still found throughout the Pine Barrens in various stages of decay, all of the industrial sites that remain comprise a cultural resource group that has the potential to yield important information about local and national history. Under the National Parks and Recreation Act of 1978, Congress set aside 1.1 million acres of the Pine Barrens to create the nation's very first National Reserve. This federally protected region is managed by a 15-member independent state agency called the Pinelands Commission, which regulates development and cultural resource preservation according to a Comprehensive Master Plan (CMP) and Cultural Resource Management Plan (CRMP). Published in 1981 and 1986, respectively, these plans have shaped historic preservation policy and cultural resource management in the Pinelands National Reserve. With a focus on sites associated with the iron industry, this thesis examines both the CMP and CRMP in order to ascertain the extent to which ecology has been favored over cultural resource preservation, and makes detailed recommendations that advocate for a balance between the preservation of nature and culture.

Keywords

viewshed, cmp, landscape preservation, industry, cultural resource

Disciplines

Historic Preservation and Conservation

Comments

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AN ASSESSMENT OF PRESERVATION OPPORTUNITIES
IN THE NEW JERSEY PINE BARRENS

Thomas James Wilson

A THESIS

in

Historic Preservation

Presented to the Faculties of the University of Pennsylvania in
Partial Fulfillment of the Requirements of the Degree of

MASTER OF SCIENCE IN HISTORIC PRESERVATION

2012

Advisor & Program Chair
Randall F. Mason
Associate Professor

“...and of the South Jersey iron industry nothing was left but memory.
Rarely had an industry been so patiently built,
and rarely had one been obliterated so swiftly.”

-Arthur D. Pierce, *Iron in the Pines*

This work is dedicated to the people of New Jersey,
and to the memory of the settlers who once inhabited the Pinelands.

I hope one day your stories are told.

Acknowledgements

First and foremost I would like to thank my advisor Randall Mason, whose support and encouragement over the past two years has proven invaluable.

Thank you for reintroducing me to the Pines.

My classmates, I could not have done this without you. Your talent and passion for preservation has served as a continuous source of inspiration during my time spent at Penn.

Thanks for all the laughs, the food, and the spontaneous dance parties.

I expect nothing but great things from all of you.

My friends and family, thank you for believing in me.

Last but not least, thank you to the pioneer explorers who investigated the Pine Barrens before me. Without you, this project would have been impossible.

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Chapter 1: Introduction

The Pine Barrens of southern New Jersey, one of the most ecologically unique regions on Earth, is comprised of nearly 1.4 million acres of dense forest. Under the National Parks and Recreation Act of 1978, over 1.1 million acres of the forest were set aside by Congress to create the Pinelands National Reserve (PNR), a legally protected area meant to conserve the unique cultural and ecological properties of the Pine Barrens. The PNR was America's very first National Reserve, and as a result of strict land-use regulations, this vast expanse of pine trees and cedar swamps remains the largest tract of undeveloped land on the Eastern seaboard.

Initially settled by Native Americans around 10,000 years ago, the Pine Barrens attracted numerous settlers during the colonial period, and for a brief period it was the site of various industries. From the late 16th century until the 1890's, full-fledged towns sprung up alongside glass factories, paper mills, tanneries and more. Although each industry that developed in the Pine Barrens had an impact on the physical and cultural landscape of the forest, none was more impactful than the iron making business. Approximately thirty iron forges and furnaces once dotted the landscape of the Pinelands, and the forest became a major supplier of bog ore and iron products for the United States during the Revolutionary War and War of 1812.¹ For over one hundred years, the iron production business in the Pine Barrens was widespread and unchallenged. However, just before the Civil War, the discovery of cheaper and more easily obtainable iron ore in Pennsylvania effectively paralyzed the iron-making business in the Pine Barrens, and when the iron forges were abandoned

¹ Karen F. Riley, *Whispers in the Pines: The Secrets of Colliers Mills* (Cassville, NJ: Cloonfad Press, 2005), pgs. #17-19.

nearly every other industry faltered shortly after. Today, many remnants of the towns and factories that were erected in the Pine Barrens still exist, albeit in various stages of decay.

Since the publication of author John McPhee's seminal book *The Pine Barrens* in 1968, much attention has been paid to the unique ecological and cultural aspects of the Pine Barrens. There has been no shortage of studies undertaken in order to classify various types of flora, fauna, and animal life, and extensive effort has been put in to mapping out areas of ecological significance. In addition, studies like ethnographer Mary Hufford's *Chaseworld*, which analyzes foxchases and foxhunters in the Pine Barrens, have helped to shed a spotlight on the folklore and cultural traditions unique to the forest. Unfortunately, while there is now an abundance of information about the ecological importance of the Pinelands, there is still decidedly less information available about the cultural and historic resources of the region. Ecology has been favored over heritage for quite some time, and many of the resources associated with the iron industry in the Pinelands are at risk of being completely eradicated.

There are two main organizations charged with the protection of cultural, historic and natural resources in the Pine Barrens: the Pinelands Preservation Alliance (PPA), a private, non-profit organization, and the Pinelands Commission, a governmental body. The PPA serves as the "public's watchdog," and its aim is to promote the unique resources of the Pinelands and convince state and local governments to afford the area special legal protections. The Pinelands Commission is a Federal entity created by Congress, and it consists of 15 Commissioners; "seven appointed by the Governor of New Jersey; one appointed by each of the seven Pinelands counties; and one appointed by the U.S. Secretary

of the Interior.”² The Commission was responsible for the creation of two pivotal documents that govern the Pinelands National Reserve: the Comprehensive Management Plan (CMP) of 1981 and the Cultural Resource Management Plan (CRMP) of 1986. This thesis will examine the extent to which the focus on the ecological importance of the Pinelands has proven detrimental to the retention of historic and cultural resources that remain, with a specific focus on the CMP and CRMP that have been developed for the area. Challenges, threats, obstacles and major players will all be taken into consideration, as will a comparison of different approaches to preservation in the area.

An analysis of preservation opportunities in the Pinelands is important for several reasons. First, many of the surviving structures represent vernacular American architecture of the colonial period, and without proper documentation, unique building styles and architectural elements may be lost forever. In addition, the plants and wildlife that are so heavily protected in the Pine Barrens are partially responsible for the accelerated deterioration of many of the surviving buildings, and therefore it is necessary to ascertain which sites are the most at risk due to overgrowth and animal infestation. This is not to say that the passage of time should attempt to be stylistically reversed, but simply that the very nature of the Pinelands contributes to the destruction of the abandoned sites in the forest, and therefore they should be more thoroughly documented in order to avoid the loss of important resources.

The New Jersey Pinelands Commission has already published a wealth of economic, legal, and survey data regarding the Pine Barrens since its formation in 1979, yet much of it

² "Commission Members," New Jersey Pinelands Commission, accessed March 1, 2012, <http://www.state.nj.us/pinelands/about/memb/>.

is outdated and in need of reassessment. The Pinelands Preservation Alliance has been a bit more proactive, yet it too has neglected to release a comprehensive analysis of the historic sites in the Pine Barrens for several years. As a result, it is my belief that a modern sweep of historic sites in the Pinelands will prove very useful, and will help the state of New Jersey to better allocate its time and resources in regards to preservation. What remains of the colonial history of the Pine Barrens is quickly disappearing, and by offering suggestions for striking a balance between environmental protection and cultural resource management, I hope to generate interest in some remarkable places that most people have no idea exist.

Chapter 2: Iron in the Pines

The Rumbblings of Industry

The original occupants of the Pine Barrens were the Lenni Lenape, a Native American tribe that flourished for thousands of years in New Jersey before the first European explorers began to arrive in the early 1600's. Initially, industry in the Pine Barrens was solely concerned with whaling, which began on the southern New Jersey coast around 1650, and shipbuilding, which began on the periphery of the forest in 1688.³ As the years progressed, however, colonial settlers and European explorers slowly began to move deeper into the interior of the Pine Barrens, eager to exploit the abundance of lumber and natural resources found within the woods. Woodcutters erected a large quantity of sawmills throughout the Pinelands, confident that future entrepreneurs would need waterpower to fuel their industries. The construction of sawmills in the Pine Barrens triggered a gradual increase in the region's population, and by the year 1700 several permanent settlements had been founded deep within the woods.⁴

Unfortunately, as is so often the case in American history, the process of expansion slowly pushed the Native Americans from their traditional settlements onto an Indian Reservation. In fact, the very first Indian Reservation in the New World was created in the Pine Barrens in 1758, and it was there that the Lenni Lenape Indians lived out their final days in what would eventually be known as New Jersey.⁵ Interestingly, the initial phase of woodcutting and shipbuilding was so severe and so harmful to the landscape that it even

³ "A Pinelands Time Line," New Jersey Pinelands Commission, January 3, 2011, accessed February 25, 2012, <http://www.state.nj.us/pinelands/infor/fact/Pinelands%20timeline.pdf>.

⁴ Arthur D. Pierce, *Iron in the Pines: The Story of New Jersey's Ghost Towns and Bog Iron* (New Brunswick, NJ: Rutgers University Press, 1957), pg. #5.

⁵ Ibid.

attracted the attention of Benjamin Franklin, who spoke out in 1749 against the “reckless and wanton slaughter of the woods” and urged “conservation and intelligent forestry.”⁶ Franklin’s wishes were ultimately lost upon the residents of the Pinelands, for as the 18th century marched on more and more people arrived looking to exploit the region’s resources.

Iron production in the Pine Barrens began nearly 250 years ago, in 1765, when the settlers who “discovered” bog ore built the very first iron furnaces in the forest.⁷⁸ Bog ore (Limonite or $\text{Fe}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$) is a reddish deposit produced when decayed vegetable matter in the streams meet iron salts that rise from the streambeds (Figure 2.1.)



Fig 2.1: Chunks of bog ore on display at Batsto Village. Photo taken by author.

⁶ Pierce, *Iron in the Pines*, pg. #5.

⁷ Pinelands Commission, “A Pinelands Time Line.”

⁸ While it is true that one furnace, the Tinton Falls Iron Works, did exist as early as 1675, it quickly fell into disarray, and many decades passed before the iron industry rose in the Pinelands at full force.

When the two mix, the solution that is created oxidizes, hardens, and is deposited along the banks of streams where it can be gathered quite easily. Bog ore had long been used by the Lenni Lenape as face paint, but when the settlers found it they were quick to exploit the resource and use it for the production of iron.⁹ It is generally agreed upon that depleted bog ore beds can renew themselves about every twenty years, yet iron production in the Pinelands became so widespread that some of the furnace records that survive indicate that bog ore became scarce and had to be imported from outside of New Jersey.¹⁰

The Iron-Making Process

In the 17th and 18th centuries, the production of iron required four key ingredients: ore, power, fuel, and flux. Bog ore came from the streams, which themselves could be dammed to provide power for machinery. Trees were chopped down and burnt to produce charcoal, the main fuel source used in the iron-making process. Nearby, the Jersey Shore provided calcium-rich clam and oyster shells, which were used to produce flux, a reducing agent vital to the iron-making process. The widespread availability of these components deep in the woods meant that most of the iron production took place in very remote places.¹¹ Once ore, power, fuel, and flux were all accounted for, production began at the most important part of the iron-making industry: the furnace.

⁹ Pierce, *Iron in the Pines*, pg. #10.

¹⁰ Charles S. Boyer, *Early Forges and Furnaces in New Jersey* (Philadelphia: University of Pennsylvania Press, 1931), pg. #2.

¹¹ John W. Sinton, *An Inventory of Historic and Cultural Resources of the New Jersey Pinelands* (New Lisbon, NJ: Pinelands Commission, 1980), pg. #15.

Every iron business in the Pine Barrens used a “blast” furnace, a particular type of furnace introduced to the American colonies by European settlers (Figure 2.2).¹² Most were square structures built of local stone, about twenty feet tall and between twelve to thirty feet wide at the base. As the height of the structure increased, the furnace tapered off and resembled a pyramid with its top cut off. Their interiors were lined with mortar, brick, and sand, and a small indentation near the hearth called a tuyere allowed air to enter the stack. Below the tuyere was a circular pit called a crucible where molten metal collected and was drawn off.¹³ Initially, large bellows were used to provide the air blast for the furnaces, but later innovations involving cylindrical tubes allowed for a steadier blast.¹⁴



Fig 2.2: A rendering of the blast furnace at Martha. Photo courtesy Bass River Township Historical Society.

When in “blast,” furnaces operated twenty-four hours a day, seven days a week, for seven to nine months out of the year. The iron-making process was laborious. First, ore, flux, and charcoal were weighed out in specific ratios, and charcoal was used to fuel a fire in the

¹² Ben Ruset, "Towers of Fire: Iron Production in the New Jersey Pine Barrens," NJPineBarrens.com, November 21, 2007, <http://www.njpinebarrens.com/>

¹³ Boyer, *Early Forges and Furnaces in New Jersey*, pg. #5.

¹⁴ Pierce, *Iron in the Pines*, pg. #12.

hearth, which heated the furnace stack. A small “charge” of bog iron ore, charcoal, and flux was then deposited into the stack in layers. Bellows forced air through the tuyere, raising the temperature near the hearth to upwards of two thousand degrees. This scorching temperature heated the charge until it became a molten mass, and the iron separated from the mixture and collected at the bottom of the stack in the crucible. Impurities in the molten iron called “slag” floated to the top, where they were removed every twelve hours and discarded.¹⁵ From the crucible, the iron was guided into molds or channels dug in the sand to produce “pigs,” or long bars of iron. After the iron had cooled and hardened, it was usually taken to a forge, where it was refined until it became wrought iron, often called “bar iron.”¹⁶

Forges were smaller operations than furnaces, and one furnace could often feed several forges. Forges consisted of several small furnaces where pig iron was reheated and then purged of impurities by being struck by a massive, water-powered tool called a tilt hammer. The tilt hammer would strike the semi-molten iron on an anvil, and after cooling and being reheated again in a second forge known as a “chafery,” the iron would again be pounded by the tilt hammer and then worked into a bar shape. When an order was placed, the finished product would then leave the forge, making its way to a blacksmith or a slitting mill. Pig iron itself is of a lesser quality than bar iron, yet it was still used to make stoves, kettles, fireplace backs and more. Bar iron could be used for tools, horseshoes and other durable metal objects, and therefore it was more valuable.

While the bog iron industry in the Pinelands began with much bustle, its inefficiency

¹⁵ Boyer, *Early Forges and Furnaces in New Jersey*, pg. #5.

¹⁶ Pierce, *Iron in the Pines*, pg. #13.

quickly proved its downfall. Bog ore, although regenerative, did not replenish itself quickly to satisfy the need of the numerous iron furnaces scattered throughout the Pinelands. More expensive iron ore had to be imported from Europe and surrounding states, causing financial strain. In addition, the quality of bog ore varied from stream to stream. As a result, some furnaces produced iron with numerous impurities that was less desirable than the iron produced by prosperous ironworks such as Batsto.¹⁷ Many ironworks were already in debt by the time the furnace was first put in blast, and many more were plagued by long histories of seizures, forced sales and sheriff's auctions.¹⁸

The discovery of better quality and more easily accessible iron ore in Pennsylvania in the late 19th-century was essentially the nail in the coffin for the iron industry in the Pinelands. Although iron production in Pennsylvania did not pick up steam until the 1830's, the use of anthracite coal as fuel for iron making proved immensely more successful than charcoal, and Pennsylvania's ironworks were located close to the anthracite fields, producing a better-quality, cheaper product.¹⁹ Railroad lines that were meant to connect the Pinelands to urban markets were abandoned, their unfinished tracks ending abruptly in the middle of the forest (Figure 2.3). Slowly but surely, every single furnace in the Pine Barrens went out of blast, and the towns that had sprung up alongside them were abandoned. As the decades passed, the forest obliterated almost every trace of an industry that had lasted, for better or worse, for over one hundred years.

¹⁷ Ruset, "Towers of Fire: Iron Production in the New Jersey Pine Barrens."

¹⁸ Pierce, *Iron in the Pines*, pg. #19.

¹⁹ John McPhee and Bill Curtsinger, *The Pine Barrens* (New York: Farrar Straus Giroux, 1981), pg. #35.



Fig. 2.3: Abandoned railroad tracks found deep within the PNR.
Likely remnants of the planned Quaker Bridge line. Photo taken by author.

Workers and Ironmasters

Iron production in the Pinelands was largely self-sufficient, and the forges and furnaces operated somewhat like plantations. Although the ironmasters of more successful forge and furnace towns like Batsto and Atsion provided lodging for their workers, most employees of the iron industry built their own homes in close proximity to the furnaces (Figure 2.4).



Fig. 2.4: Worker homes at Batsto Village. Photo courtesy Bill Reedy.

When the furnace was in blast, they worked almost every single day for seven to eight months straight.²⁰ On the few occasions that they had to enjoy leisurely pursuits, workers would go fishing, hunting, or drinking at the local tavern, often miles away in the middle of nowhere. Aside from a furnace and a forge, most iron-making towns also had a company

²⁰ Although early furnaces could only stay in blast for sixteen to eighteen weeks, advances in technology at the beginning of the 19th century lengthened the time to seven or eight months.

store and an owner's mansion. Some of the larger towns, like Batsto and Atsion, even had churches and schools. The company store would keep track of everything purchased by the workers' wives, and because they were in the middle of nowhere, prices were often inflated, resulting in widespread debt amongst the worker families living in the towns.²¹ While the workers' homes were quite rudimentary, the ironmasters' houses were often quite extravagant (Figure 2.5).²²



Fig. 2.5: The recently restored Richards mansion at Atsion, built by ironmaster Samuel Richards.
Photo taken by author.

²¹ New Jersey State Park Service, Division of Parks and Forestry, *Batsto Through the Years: A Teaching Resource* (Hammonton: Batsto Citizens Committee, 2008), pg. #25, accessed December 2, 2011, http://www.state.nj.us/dep/parksandforests/parks/docs/batsto_teaching_resource.pdf.

²² Pierce, *Iron in the Pines*, pg. #18.

The ironmaster's house, often called the "big house," was surrounded by shrubbery, picket fences, and a flower garden. Architecturally, these houses employed various popular building styles, and many were embellished with Classical and colonial design elements. Some of the more elaborate houses had luxurious touches, like marble floors, black walnut paneling, and later electricity.²³ Still, the relationship between the ironmaster and the workers and their families was generally a positive one, and the gate to the ironmasters' house was "always unlatched."²⁴ From medical emergencies to missing husbands (who sometimes got drunk and lost in the woods), the ironmaster listened and provided for the people in the iron making towns. All in all, it was a fairly paternalistic arrangement.

One of the first entrepreneurial ironmasters of the Pine Barrens was Charles Read, a well-travelled lawyer, New Jersey statesman and friend of Benjamin Franklin. Read, who moved from Philadelphia to Burlington County with his wife Anne in 1739, built four of the oldest and most important furnaces in the Pinelands: Etna, Atsion, Taunton, and Batsto.²⁵ While these four furnaces were briefly prosperous, they quickly became far too expensive for Read himself to support, and so he looked to friends and political connections for investments. Unfortunately, even outside help could not pull Read out of debt, and after his wife died in 1769 he fled to Antigua and then to St. Croix to avoid his debtors and his grief. He died in 1775, just a year before his iron empire would prove itself a crucial center of weapon making for the American colonists. While Read never got to see his empire flourish, he laid the groundwork for a substantial industry that developed after his death.

²³ Barbara Solem-Stull, *Ghost Towns and Other Quirky Places in the New Jersey Pine Barrens* (Medford, NJ: Plexus Pub., 2005), pg. #62.

²⁴ Boyer, *Early Forges and Furnaces in New Jersey*, pg. #6.

²⁵ *Ibid*, pg. #154

Following Charles Read, men like Isaac Potts, Samuel Richards, and Joseph Ball erected ironworks in the Pinelands, eager to cash in on the burdening industry.²⁶ From the Pine Barrens came the very first iron pipes to be laid in lower Manhattan, as well as a majority of the cannonballs and ammunition used in the Revolutionary War and the War of 1812. The iron industry and other natural resources of the Pine Barrens attracted other entrepreneurs, and soon paper mills, tanneries, and glass factories were built in close proximity to the furnaces and forges that dotted the forest landscape. During the heyday of industry in the Pine Barrens, nearly fifty-five towns existed in the middle of the woods, towns with such unique names as Ong's Hat, Double Trouble, Calico and Martha (Figure 2.6). Of these fifty-five towns, around thirty of them produced iron, and only two remain today. The rest are naught but ruins and rubble, lonely reminders of an industry which once dominated the forest .

²⁶ Pierce, *Iron in the Pines*, pg. #5.

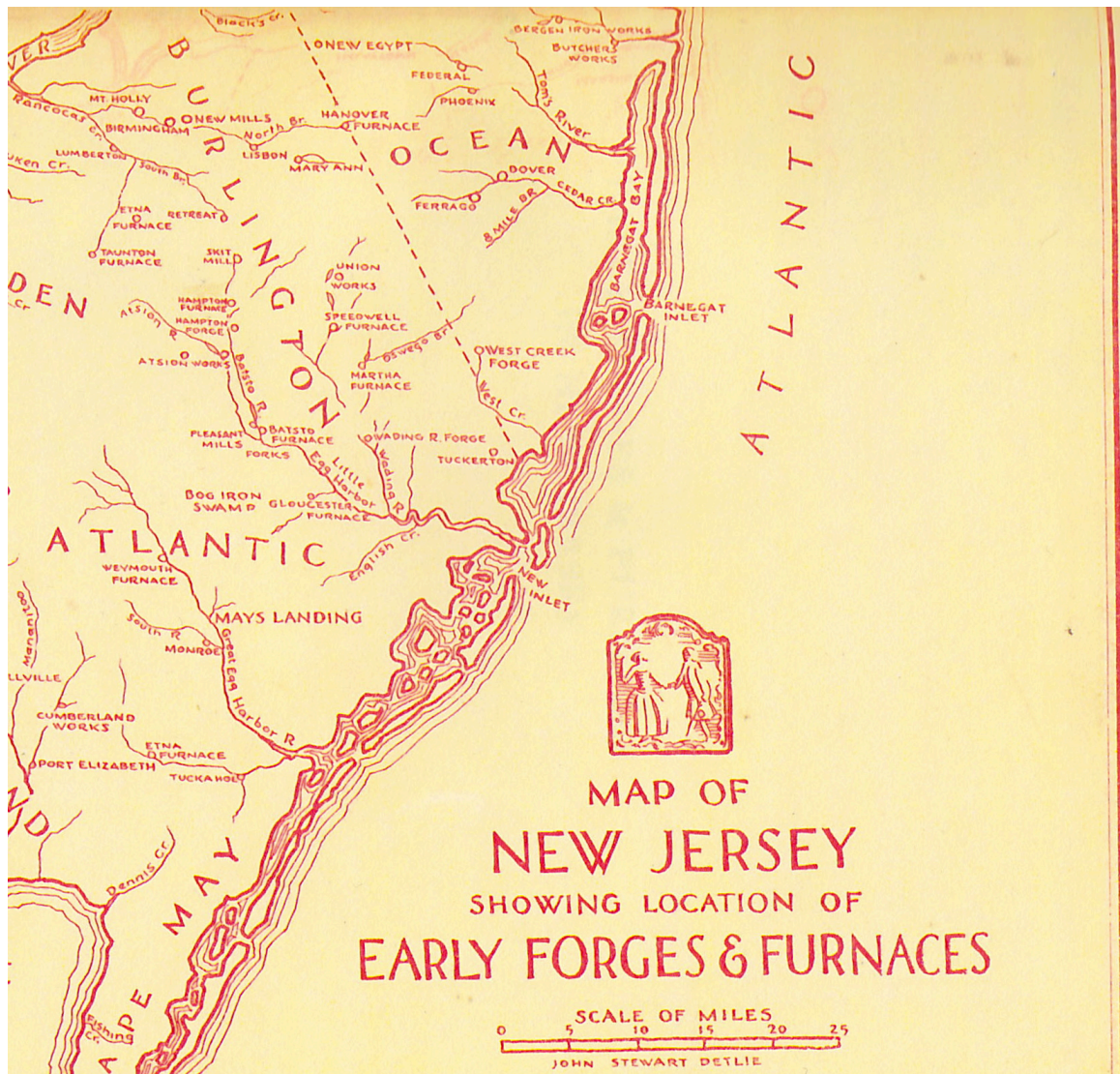


Fig. 2.6: A map of the early forges and furnaces of New Jersey by John Stewart Detlie. This map is the faceplate in Boyer's *Early Forges and Furnaces in New Jersey*.

The Wharton Tract

Following the collapse of the iron business in the Pine Barrens, the other industries that had settled there slowly went out of business. It was at this time, around 1873, that Philadelphia philanthropist Joseph Wharton started to acquire forgotten properties in the



Fig. 2.7: Joseph Wharton.
Photo courtesy the
University of Pennsylvania.

Pinelands (Figure 2.7). Wharton, Philadelphia philanthropist and founder of the Wharton School at the University of Pennsylvania, had a tremendous amount of capital, and as a result he easily acquired the forgotten lakes, abandoned furnaces, and dilapidated mansions that were being sold off en masse in the Pinelands. While Wharton was keen to acquire land in the Pinelands for numerous reasons, his main interest was one resource that

had yet to be tapped in the region: water. Underneath the fruitless soil of the Pine Barrens lies the Kirkwood-Cohansey aquifer, a 17-trillion gallon reserve with some of the purest drinking water on Earth. Wharton sought to exploit the aquifer and transfer its clean water supply to the city of Philadelphia via a series of dams and underground iron pipes.

Fortunately, the New Jersey legislature was tipped off to Wharton's plans, and in 1878 a law was passed prohibiting the export of water from the state. As his plans were foiled, Wharton instead concentrated on agriculture and lumber.²⁷

In 1876, Wharton acquired the Batsto plantation for cheap, and over the next twenty years he acquired a total of 125,000 acres of the Pine Barrens at rock-bottom prices. The region fascinated Wharton, and he spent thousands of dollars on the restoration of Batsto

²⁷ New Jersey Division of Parks and Forestry, *Historic Batsto Village* (Hammonton: Wharton State Forest, NJ).

Village and the development of the cranberry industry throughout his land holdings. By the time he died in the year 1909, Wharton had acquired nearly 2.5% of New Jersey's land. His surviving family members offered the land to the state of New Jersey, which had long desired to have control of the Kirkwood-Cohansey aquifer that lay beneath the soil. The Wharton tract was offered for sale in 1912 at the price of \$1,000,000, and although the New Jersey government moved quickly to acquire the land, it was hindered by opposition. Most of the opposition came from the seven Pinelands counties in South Jersey, for several townships depended on the taxes paid by the Wharton family to support their revenues.²⁸ Three years later, on November 2, 1915, a statewide referendum was held to settle the matter. In the end, the move to acquire the Wharton tract was defeated, and over thirty years would pass before the land would go up for sale again.

The Rise of The Pineys

For over four centuries, the Pine Barrens has been looked upon as a place of residence for those unfit to dwell amongst the "normal" population. From Hessian deserters and murderous pirates to Huguenot exiles and colonial criminals, the vastness and remoteness of the Pinelands has long made it an attractive place for those looking to hide. This perceived isolation from the rest of society has given birth to a slew of folkloric tales concerning evildoers, inbreeding, and even mythical creatures. The "Jersey Devil," for example, is a dangerous beast that allegedly lives in the Pine Barrens and is reported to have the head of a horse, the face of a dog, the body of a serpent and large, bat-like wings

²⁸ Pierce, *Iron in the Pines*, pg. #7.

(Figure 2.8).²⁹ It has supposedly been spotted by residents of New Jersey since the late 1700's. Much of the folklore and traditions that developed in the Pine Barrens can be attributed to the European settlers who lived in the forest and spread their traditions to their children, contributing to a unique cultural heritage that is unlike any other in the United States.

Regrettably, even as farmers moved in and industry took hold, the region was still seen as a backwater, and as the rest of the nation progressed into the 20th century, the people of the Pines were believed to be worlds behind. Following the collapse of

industry in the Pine Barrens, those who remained attempted to survive off the land, and many of them collected cranberries, blueberries, pinewood, and sphagnum moss in order to make a living. Many had no choice but to find work outside the Pines or leave the forest entirely. As the residents of the Pinelands became more and more isolated from the outside world, malicious stories began to circulate about incestuous relations and physical deformities, and many residents of New Jersey were convinced that the dubiously named "Pineys" were culturally and mentally inferior. This is a perception that still exists in New



Fig. 2.8: A drawing of the Jersey Devil from the *The Philadelphia Evening Bulletin*, January 1909.

²⁹ James F. McCloy and Ray Miller, *The Jersey Devil* (Wallingford, PA: Middle Atlantic Press, 1976), pg. #35.

Jersey to this day, albeit to a much lesser degree.

The Turn of the Tide

In 1946, the United States government began to eye the Pine Barrens as a potential site for the United States Air Force Academy, or even as an overseas freight terminal.³⁰ The state of New Jersey was still interested in the land as well, but more so because the state's increasing population and small size meant that its water was steadily running out. As a result, on December 30, 1954, the state made a deal with the descendants of Joseph Wharton to purchase the eastern portion of the Wharton tract, a 56,000-acre stretch of land, for \$2,000,000. In addition, the state was granted the exclusive option of purchasing the western portion of the tract for an additional \$1,000,000, which it did several months later.³¹

Within the Wharton tract lie the remnants of the 55 towns which once thrived deep within the woods. Not only did the acquisition of the land by the state of New Jersey mean that its water supply fears could be placated, but also that a truly unique cultural resource group was now seemingly protected. Still, the retention of the Pinelands' cultural heritage was not part of the explicit rationale for the acquisition of the Wharton tract, and less than a decade after the purchase of the Wharton tract a development was planned for the Pine Barrens that almost obliterated the landscape. In 1964, a defunct agency known the Pinelands Regional Planning Board proposed a "supersonic jetport" and metropolis of 250,000 people in the middle of the Pinelands.³² The plan had some supporters, but growing interest in the ecological and historical value of the Pine Barrens ultimately proved its

³⁰ Pierce, *Iron in the Pines*, pg. #7.

³¹ Ibid, pg. #6.

³² Pierce, *Iron in the Pines*, pg #6.

downfall. Then, in 1967, a book was published that was to change the fate of the Pine Barrens forever.

Author and naturalist John McPhee's book *The Pine Barrens* was the first account of the area's natural and cultural beauty to ever reach a national audience. The book, which detailed McPhee's travels throughout the Pinelands, served to demystify the region and emphasize its beauty and its rich history. McPhee described his interactions with colorful locals, and discussed rare plants with names like "neverwet" and "whippoorwill shoe."³³ He gave the reader a sense of what the Pine Barrens looked, smelled, and sounded like, and dispelled rumors that the Pine Barrens was populated with tax-evading, unintelligent inbreds. McPhee's book was widely read and immensely impactful, and it inspired a wave of public outcry for the protection of the region's natural and cultural resources.³⁴ As written in the New York Times Magazine in 1985, McPhee's "celebration of this last bastion of rustic splendor amid the growing eastern megalopolis helped lead to the federal and state governments' decision to protect the Pinelands from destructive overdevelopment."³⁵

In 1971, just four years after the publication of *The Pine Barrens*, the state of New Jersey created the Pinelands Environmental Council and charged it with the creation of a master plan for the more than 320,000 acres that the state had acquired over the years. After the plan was developed, a Pinelands Review Committee was created in order to clearly define the boundaries of the Pinelands. In 1977, the legalization of casino gambling that began in Atlantic City intensified development pressure on the Pine Barrens. Fortunately, on

³³ McPhee, *The Pine Barrens*, pg. #53.

³⁴ New Jersey Pinelands Commission, "A Pinelands Time Line."

³⁵ Randall Rothenberg, "Here Comes New Jersey!," *The New York Times Magazine*, October 6, 1985, accessed November 25, 2011, ProQuest Historical Newspapers.

November 10, 1978, the National Parks and Recreation Act was passed into law, establishing the Pine Barrens as the country's first National Reserve. Then, on June 28, 1979, following the creation of a Pinelands Commission in February, Governor Brendan T. Byrne signed the Pinelands Protection Act, legally protecting the cultural and natural resources of the Pine Barrens. In November of 1980, the Pinelands Commission adopted a comprehensive management plan for an area of almost 556,000 acres, which was approved by Governor Byrne on January 16, 1981. Finally, nearly seventy years after the state had first attempted to save the Pine Barrens, it had succeeded at last.

Chronological Overview of The Pinelands National Reserve

- **1878-** Joseph Wharton's plan to export water from the Pinelands is blocked by the New Jersey legislature.
- **1909-** Wharton dies, passes nearly 2.5% of New Jersey's land to his family.
- **1912-** The Wharton tract is offered to the New Jersey government for \$1,000,000, but is hindered by widespread opposition in South Jersey.
- **1915-** Statewide referendum decides against the acquisition of the Wharton Tract.
- **1946-** U.S. Government eyes the Pine Barrens as a potential site for the United States Air Force Academy or an overseas freight terminal.
- **1954-** New Jersey buys the eastern portion of the Wharton tract (56,000 acres) for \$2,000,000 and the western portion for \$1,000,000 (approximately 45,000 acres).
- **1964-** The Pinelands Regional Planning Board proposes a jetport and city of 250,000 deep within the Pine Barrens.

- **1967**- John McPhee's *The Pine Barrens* is published.
- **1971**- Pinelands Environmental Council created to prepare a master plan for the management of the Pine Barrens.
- **1977**- Pinelands Review Committee is created to define the boundaries of the Pine Barrens.
- **November 10, 1978**- the National Parks and Recreation Act passed into law, establishing the Pine Barrens as the country's first National Reserve.
- **February 8, 1979**- Pinelands Commission established.
- **June 28, 1979**- Governor Brendan T. Byrne signs the Pinelands Protection Act
- **1980**- Pinelands Commission adopts a Comprehensive Management Plan for the Pine Barrens.
- **January 1981**- Governor Byrne approves the CMP.

In 1980 and 1981, more literature was produced about the Pine Barrens than at any other point in history. Studies about the natural, cultural, and historic resources of the Pinelands poured forth, and tackled topics as diverse as environmental management concerns and the preferred view sheds of Pine Barrens residents. Researchers studied land-use patterns, defined cultural historic study units, and offered suggestions for the development of tourism and recreational activities that were mindful of the region's unique ecosystem.³⁶ The Comprehensive Management Plan (CMP) even divided the state's land holdings into nine distinct typologies, each with its own rules about development. Five years later, the Cultural

³⁶ Sinton, *An Inventory of Historic and Cultural Resources of the New Jersey Pinelands*, pg. #11.

Resource Management Plan (CRMP) offered additional solutions for the management of cultural resources. Unfortunately, the fervor over the Pine Barrens was short-lived. Since 1986, very little has been published about the Pinelands, and the state of New Jersey has fixed its attention solely on the promotion and protection of the Pinelands' natural resources. Part of this has to do with the emphasis placed on the protection of the region's buffer zones that has drawn attention away from the equally, if not more important core of the forest. As a result, over the past twenty-five years, many of its cultural and historic resources have nearly vanished.

The period of industry deep within the Pinelands left traces of its existence all over the landscape. When walking the stagecoach roads that crisscross the Pines, shimmering bits of bluish-green iron slag sparkle in the sunlight, remnants of the iron business that once thrived within the woods

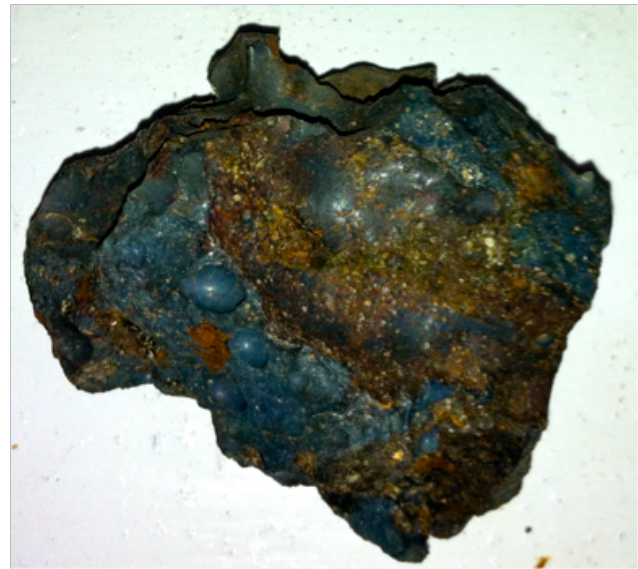


Fig. 2.9: A piece of iron slag. Photo taken by author.

(Figure 2.9.) Patches of cleared forest are littered with bottles and shards of colorful Jersey glass, discarded vestiges of glass factories which once existed in the Pinelands. Amidst crumbling ruins, one finds piles of bricks, terracotta pots, chunks of coal, glass fragments and shards of pottery. Unfortunately, the CMP and CRMP created by the Pinelands Commission and endorsed by the state of New Jersey have proven insufficient protection for the historical resources of the region.

Chapter 3: Current Issues

Cultural resource management is an ongoing process that requires flexible planning, thorough documentation, and active stewardship. The protection of cultural resources in the Pine Barrens has been heavily informed by the recommendations and mandates of the Pinelands Commissions' CMP and CRMP. While the Comprehensive Management Plan was developed to protect cultural resources in several specific ways, the Cultural Resource Management Plan advocated a more holistic approach. By analyzing both of these plans, this chapter will make clear the extent to which the Pinelands Commission and the state of New Jersey have failed to protect the region's cultural and historic resources.

The Comprehensive Management Plan

The first step in the Pinelands Commission's Comprehensive Management Plan was the "acquisition of lands with recognized historic value."³⁷ The acquisition process essentially began twenty-five years before the CMP was created, when the state of New Jersey attained the Wharton tract. Since then, the state has acquired a total of nearly 1.1 million acres of land. The Comprehensive Management Plan divided the Pinelands into nine land-use types, which were based on natural features (flora and fauna), cultural features, existing land use patterns and projected needs.³⁸ Each type has a distinct set of rules that determine the allowed types of land use. These nine types were then distributed among a *Preservation Area* and a *Protection Area* (Figure 3.1).

³⁷ Ralph E. Good, *Ecological Solutions to Environmental Management Concerns in the Pinelands National Reserve: Proceedings of a Conference* (New Brunswick, NJ: Rutgers University, Center for Coastal and Environmental Studies, Division of Pinelands Research, 1982), Background.

³⁸ Ibid.

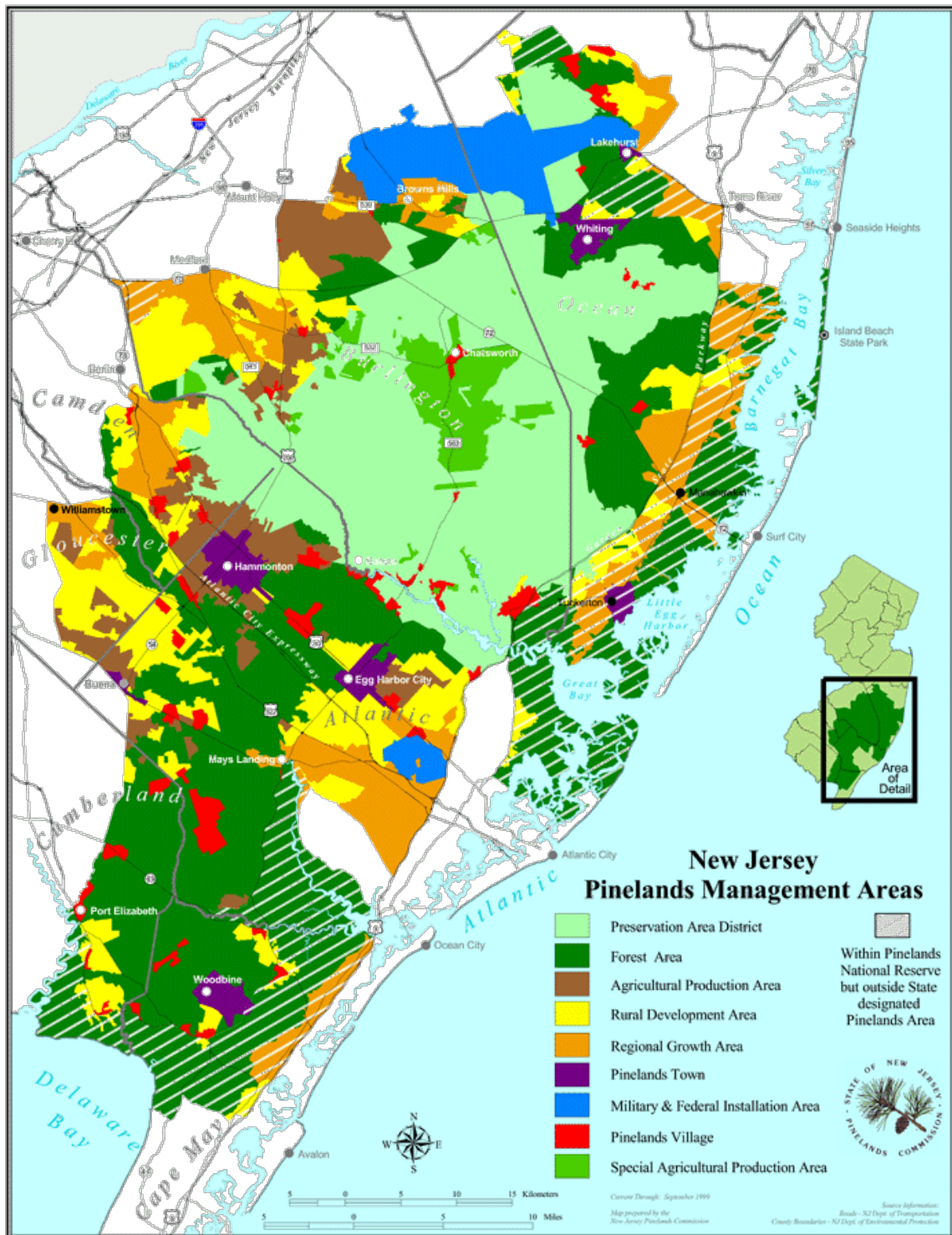


Fig. 3.1: A graphic representation of the nine land-use types and the Preservation Area.
Map courtesy of the Pinelands Commission.

These larger areas aimed to promote preservation of the land while allowing for the operation of compatible agricultural and recreational uses and prohibiting conflicting development. Of the two, the Preservation Area, which is comprised of the Wharton, Brendan T. Byrne, and Bass River State Forests, has the stronger preservation provisions.

The 9 land use types can be summarized as follows:³⁹

- **Preservation Area District** -- 288,300 acres. The largest and most critical ecological region in the Pine Barrens. A vast and wild area of forest that is home to numerous rare plants and endangered species. Residential development is forbidden, with the exception of one-acre lots within designated infill areas (totaling around 2,000 acres of available land.) Inhabitants of the Pine Barrens who arrived before the Pinelands Protection Act of 1979 are given a “cultural housing” exception and are allowed to remain so long as their adjacent property holdings exceed 3.2 acres. Commercial uses are extremely limited, and can exist only in designated infill areas. All of the iron-making sites addressed in this paper are found within the Preservation Area.
- **Special Agricultural Production Area** – 40,300 acres. Used for the cultivation of native plants and berries (cranberries and blueberries in particular.) The only allowable residential housing must be associated with a farm, and the only non-residential use permitted is the expansion of existing agricultural production facilities.
- **Forest Area** – 245,500 acres. With a very high ecological value, the Forest Area is largely undeveloped and contains uncontaminated, valuable water resources. Residential density is limited to one home for every 28 acres.
- **Agricultural Production Area** – 68,500 acres. These areas are used mostly for agricultural purposes, predominately row crops. Farm-related housing on 10 acres and non-farm housing on 40 acres are allowed. Non-residential uses must be related to agriculture, and must exist within a cluster of existing commercial spaces.
- **Rural Development Area** – 112,500 acres. These buffer areas balance the conservation of the environment with the need for residential development and roadside retail.
- **Military and Federal Installation Area** -- 46,000 acres. Government-controlled areas that include military bases and the Atlantic City airport. The government is encouraged to preserve natural and cultural resources, but cannot be forced by the State to comply.

³⁹ Land use areas in the Pine Barrens do not cluster; the different types are scattered throughout the Pinelands.

- **Pinelands Villages** -- 24,200 acres. 47 existing historic settlements where development is permitted consistent with the existing character of the village. Residential development is allowed on 1-acre lots without sewers. No historic sites associated with the iron industry are included in this typology.
- **Pinelands Towns** – 21,500 acres. Six large, existing settlements predating the Pinelands plan. Infill development and redevelopment allowed. No historic sites associated with the iron industry are included in this typology.
- **Regional Growth Area** – 77,200 acres. New housing and commercial development in the Pine Barrens is encouraged in the Regional Growth Area. Industrial uses are also permitted.

While some might argue that the acquisition of land and strict land use provisions put into place by the CMP inherently protect the industrial sites which dot the forest, these policies merely preserve the *land*, they do not legally protect the sites or cultural resources themselves. In addition, while the goal of the CMP's land acquisition phase was to protect the ecological resources of the Pinelands, rare plant species are only afforded legal protection if they are listed as "Endangered" on the CMP's register of rare plants, which has not been updated in over thirty years. To be fair, the development of the nine land-use types has proven an effective and efficient way to preserve the landscape of the Pinelands. Still, the lack of protection afforded to cultural resources has proven harmful to the historic sites that exist in the Pinelands.

Currently, there are only two historic preservation protections afforded to historic sites in the Pine Barrens. For sites listed on the National and State Register of Historic Places, a Certificate of Appropriateness (COA) is needed before any preservation project can begin. Of the twenty-five sites identified in this paper, only three of them (Hanover, Batsto and Atsion) are designated on both the State and National Registers. The second protection

requires development projects near historic sites to conduct a Cultural Resource Inventory (CRI) of the area prior to construction. If the CRI determines that minimal historic and archaeological fabric exists, the developer does not need to obtain a COA. Preservation in the Pine Barrens is carried out by local municipalities, and while the Pinelands Commission has widely disseminated its findings on cultural resource management, it cannot force local governments to comply with its recommendations.

It would be useful at this juncture to delve deeper into the term “cultural resource” and discuss how it differs from the term “historic site.” A cultural resource is a physical or intangible asset whose value is often ascribed by a local population. Examples of cultural resources include archaeological items, folklore, and landscapes. Cultural resources can be representative of historic, traditional or contemporary cultures, and cultural resource management and landscape preservation are often difficult to undertake due to the intangible nature of the resource that has been identified as important. Historic sites, on the other hand, are defined by external professional standards, and their local significance is sometimes overlooked. Structures, landscapes sites and buildings identified as historic sites are usually legally protected and only considered historic if they are identified as locally or nationally significant. It is far easier to stabilize or preserve a tangible object such as a brick wall than to prevent the loss of a viewshed or a rare oral tradition. In the case of the Pine Barrens, the use of easements and other strategies has indeed served to protect the area’s unique ecological resources, but cultural resources are not always tied to the soil, and the simple acquisition has not served to explicitly protect them. Owning the resources does not necessarily preserve them; it takes active management of change.

The next strategy of the Pinelands Commission's Management Plan was the use of "easements and other strategies" in order to protect cultural and natural resources.⁴⁰ A Development Credit system was created to compensate landowners for their loss of land-use options following the creation of the nine land-use types. Landowners can buy and sell development credits via the State Pinelands Development Bank. In addition, local governments are compensated for tax opportunities lost because of zoning restriction and public land acquisition through payments from the state in lieu of taxes. Additional loans and grants are available for local management practices that promote the desired uses of the land as determined in the Pinelands Comprehensive Management Plan.

The CMP also created provisions for maintaining land use patterns related to rural and traditional lifestyles, promoting the preservation of farmland and other agricultural sites. This can be seen as a preliminary attempt at cultural landscape preservation. While most of the residents of the Pine Barrens have more mainstream jobs to support their income, some still rely entirely on the land. For generations, residents of the Pine Barrens followed a cyclical job schedule that corresponded to the seasons: the gathering of sphagnum moss in the spring, the cultivation of blueberries and cranberries in the summer, the felling of trees in the fall, and the production of charcoal in the winter.⁴¹ While the production of charcoal and the gathering of sphagnum moss have been dramatically reduced, many people still make a living off of berry cultivation and the gathering of lumber. As a result, traditional land use is encouraged, and most new construction can only expand upon already-existing residences and agricultural buildings.

⁴⁰ New Jersey Pinelands Commission, "The Comprehensive Management Plan," (1986) pgs. #236-242.

⁴¹ McPhee, *The Pine Barrens*, pg. #39-43.

Special provisions for maintaining traditional land use patterns are indeed an effective and important component of the CMP. More of an effort should have been made to notify the residents of the Pinelands about the very likely possibility of cultural resources located on private property. Still, traditional land-use patterns require large, undeveloped tracts of land, and thus the natural legacy of the Pinelands has been pretty well protected.

In order to offer further protect the area's precious water resources, the CMP also recommended the designation and protection of wild and scenic rivers. Of the several major rivers that wind through the Pinelands, only the Maurice River and the Great Egg Harbor River have been designated as National Wild and Scenic Rivers. The protections afforded to bodies of water until the National Wild and Scenic Rivers System does not provide the same protections as designation as a National Reserve or Wilderness Area. Instead, the designation is meant to draw attention to the unique values of the river and advocate for the preservation of its viewsheds. As the Mullica River (formerly Little Egg Harbor River) cuts right through the Pinelands Preservation Area and once powered many of the gristmills feeding industry in the forest, it too should have been listed as a National Scenic and Wild River.

Next on the list of the CMP was the development of scenic and natural trails throughout the Pinelands. The state of New Jersey has done a good job on this aspect of the plan, and paths like the 50-mile long Batona Trail cut across some of the most unique and visually pleasing parts of the Pinelands. Still, there is no signage save for tattered paper notices stapled to trees proclaiming the rules and regulations of the Wharton State Forest. The trail provides a great opportunity for visitors to get an overview of the important of the Pine Barrens, but it offers little in the way of educational or expository material. Small

placards on trees could highlight not only unique ecological facts about the Pinelands, but also the location of former towns and villages, which are not noted at all.

The last preservation goal of the Pinelands Comprehensive Management Plan was to increase public appreciation of Pinelands history and culture. While the Preservation Area has seen an increase in visitors looking to take advantage of natural and recreational opportunities, the promotion of forgotten historic resources deep within the forest has been minimal. Most of the sites have archaeological resources just several inches below the subsoil, and the arrival of curious visitors looking to grab some “treasures” of their own could result in a huge loss of artifacts. While conducting field research for this thesis, the only other people I encountered were a man and a woman with a large bag of bog iron slag and other trinkets, and they claimed they had been doing it for around 20 years.

Overall, the Pinelands Commissions’ CMP overwhelmingly favored the protection of the natural environment. While some aspects of the plan have indeed served to aid historic preservation in the Pinelands, it has been mostly coincidental. There was never an indication in any of the documents utilized in the preparation for this thesis that the Commission sought to strike a balance between the preservation of natural and cultural resources, and the preservation of the flora and fauna always came before the preservation of the built environment. Inaction on the state’s part has led to the loss of valuable resources, and while the threat of development has mostly been mitigated, neglect and vandalism are still very real issues.

The Cultural Resource Management Plan

As part of the continuing mission of the CMP, the Pinelands Commission published a Cultural Resource Management Plan for Historic Period Sites on March 7, 1986. This supplemental study was meant to elaborate on the CMP's original recommendations, and to further explain the standards established in Part XV of the CMP: Historic, Archaeological and Cultural Preservation. The supplementary guide was also intended to aid municipal governments and local historic preservation committees to easily and efficiently follow the provisions laid out in the CMP. Local municipalities are responsible for the review of development applications within each of the seven Pinelands counties. As a result, the provisions laid out in the CMP and CRMP place almost all of the responsibility of the protection of historic and archaeological resources with local governments.

The Cultural Resource Management Plan was written in a way that is easily understood, even by those who have no prior experience in the field of cultural resource management. It provides a step-by-step guide to aid in the "identification, evaluation, and treatment" of cultural resources which municipal agencies may use to identify important potential sites located in proposed development areas.⁴² While the focus of this thesis is on the former iron forge and furnace sites which once dotted the forest landscape, there are actually several other categories of historic sites found throughout the Pinelands. A brief overview of these sites will help to illuminate the types of cultural resources that exist within the forest and put the iron forge and furnace sites in context. The Cultural Resource

⁴² New Jersey Pinelands Commission, "The Pinelands Cultural Resource Management Plan for Historic Period Sites" (1991), Foreword.

Management Plan's analysis of cultural resources has divided Pine Barrens sites into nine distinct categories, which I have summarized below. Each overview is accompanied by a brief explanation of research potential and current state of preservation:

1. Agricultural Sites and Gristmills

- **Time Frame:** 1700- present (Gristmills ceased operation in 1920.)
- **Overview:** Agricultural sites include farms, barns, farmhouses, market places, and areas of berry cultivation. A detailed study of the resource group has never been carried out, and the Pinelands Commission has only inventoried "agricultural areas," not individual sites. Gristmills, used to grind grain into flour, were often a component of agricultural sites. As it was impractical to build a gristmill to serve only a few families, the presence of gristmills can be used as an indication that there was once a large amount of people settled in the vicinity.⁴³
- **Potential Yield:** Information about ethnic settlement patterns, undocumented vernacular architecture.
- **Status of Resource Group:** Good

2. Glasshouses

- **Time Frame:** 1800-1875. (Some glasshouses operated until 1920.)⁴⁴⁴⁵
- **Overview:** The glass industry sustained the population of the Pinelands following the collapse of the iron forges and furnaces in the mid 19th-century. Traces of settlements and structures associated with glassmaking can be found throughout the forest. Many sites associated with the glass industry contain ruins, but only one has been investigated and excavated at an "acceptable" level.⁴⁶
- **Potential Yield:** As the glass industry heavily exploited the region's natural resources, a study of the resource group could yield information about its effect on the current forest landscape.
- **Status of Resource Group:** Defunct

3. Iron Forges and Furnaces

- **Time Frame:** 1765-1865
- **Overview:** Iron-making in the Pine Barrens was the most successful industry to exist in the region, and it was responsible for a population boom that greatly impacted the physical and cultural landscape. Extremely few structures associated with the iron industry remain, and many sites are in

⁴³ Sinton, *An Inventory of Historic and Cultural Resources of the New Jersey Pinelands*, pg. #12.

⁴⁴ Pinelands Commission, "Cultural Resource Management Plan," pg. #76.

⁴⁵ Sinton, pg. #15.

⁴⁶ Cultural Resource Management Plan, pg. #76.

imminent danger of being permanently lost. Only one out of approximately 30 sites has been excavated.

- **Potential Yield:** Information about the making of the current forest landscape, New Jersey's colonial history, and ethnic settlement patterns.
- **Status of Resource Group:** Defunct

4. Maritime Activities

- **Time Frame:** 1664-1900
- **Overview:** Maritime activities included shipbuilding, whaling, and transportation. Sites associated with this resource group include docks, shipwrecks, ports of call, and manmade changes to coastal and river lines.
- **Potential Yield:** Information about the influence of maritime activities on settlement in the Pine Barrens. Several sites are important for their role in the history of American independence. 59 sites and 870 shipwrecks have been identified.⁴⁷
- **Status of Resource Group:** Mostly defunct, although some shipbuilding operations continue.

5. Minor Industries

- **Time Frame:** 1830-1930
- **Overview:** Several minor industries once existed in the Pinelands, and produced items such as paper, cotton, brick, leather, and terra cotta. Many of the sites associated with minor industries are in much better condition than those associated with the iron and glass industries.
- **Potential Yield:** Information about "daily life and social patterns in the 19th century" and the evolution of industrial buildings.⁴⁸
- **Status of Resource Group:** Defunct

6. Sawmills

- **Time Frame:** 1700-present
- **Overview:** Sawmills still exist in the region, but none prior to 1900 are still extant. Still, the ruins or indication of a sawmill hints at earlier, permanent settlements.
- **Potential Yield:** Information about early settlement patterns and their effect on the forest landscape.
- **Status of Resource Group:** Some sawmills (non-historic) remain in operation.

7. Settlements

- **Time Frame:** 1700-1960

⁴⁷ Pinelands Commission, "Cultural Resource Management Plan," pg. #120.

⁴⁸ Ibid, pg. #146.

- **Overview:** Communal settlements developed on the fringes of the Pinelands at different time periods in response to varied natural and cultural forces. Settlements have not yet been divided into different typologies.
- **Potential Yield:** More knowledge about the effects of technological innovations on development patterns in the Pinelands and potential for new historical discoveries.
- **Status of Resource Group:** Some settlements still exist, although no new settlements have been founded over the past 50 years.

8. Transportation Routes and Railroads

- **Time Frame:** Roads, 1700-present; Railroads 1850-present⁴⁹
- **Overview:** A remarkable number of labyrinthine sand roads cut across the Pine Barrens, and their existence is yet another indication of the dramatic effects of commerce and settlement on the landscape. So-called “stagecoach” roads are still used to traverse the region. Railroad lines also bisect the forest, and their expansion contributed to the growth and expansion of colonial and current settlements. Some tracks stop dead in the middle of the forest, an indication of the collapse of rural industry.
- **Potential Yield:** Knowledge about the development of transit routes and settlements patterns. Extant historic railroad stations could provide valuable examples of undocumented vernacular architecture.
- **Status of Resource Group:** Stable

9. Residential Architecture

- **Time Frame:** 1700-present
- **Importance:** Residential houses “reflect the building traditions of the cultural groups who settled the Pinelands.”⁵⁰ High-style architecture was often imitated in a more rudimentary fashion in the interior of the Pine Barrens with local materials.
- **Potential Yield:** Documentation of vernacular architecture, evidence of ethnic settlement patterns
- **Status of Resource Group:** Most historic buildings are defunct, more modern sources are available for investigation

These nine historic site categories are further divided into subcategories and cross categories, which hints at the depth of available historic resources in the Pinelands. A description of each site typology is accompanied by a history, recommendations for research,

⁴⁹ Sinton, *An Inventory of Historic and Cultural Resources of the New Jersey Pinelands*, pg. #16.

⁵⁰ Pinelands Commission, “Cultural Resource Management Plan,” pg. #210.

and an analysis of historic preservation opportunities. Unfortunately, through the process of field research, site visits, and conducting interviews with residents and other stakeholders, it has become clear that the recommendations made regarding sites associated with the iron industry and industry in general have not been implemented. Consider the CRMP's contains a multi-pronged plan composed of five ultimate goals:

1. Increase public knowledge of the need to protect and manage Pinelands natural, cultural, and historical resources.

While the natural resources of the Pinelands continue to be touted to tourists and residents, public knowledge of the region's unique cultural and historical resources is still limited. This is based on a variety of factors, including the lack of funding available for historic preservation, the requirement that New Jersey public schools only have to teach one year of state history, and a focus on development and environmental issues.

2. Attract and direct visitors to Pinelands areas able to handle visitation and away from areas unsuitable for increased public use.

Exploration and exploitation of the Pinelands is largely unregulated and unchecked. Hunters hunt off-season and drive their trucks and SUV's across the forest, contributing to the destruction of the landscape. Nature trails cut right through sensitive historic areas and brush alongside ruins and artifacts that are then plundered by visitors. Without a designated spot to ride their off-road vehicles, dirt bike enthusiasts have been shredding up hundreds of acres of the Pine Barrens. Too many uses are allowed in the Pine Barrens, and the current forest landscape is indicative of the detrimental affects of tourism and recreational opportunities.

3. Coordinate and disseminate existing information about Pinelands resources and resources experts among state and local public and private agencies and organizations.

The dissemination of information about Pinelands resources seems to have been widespread in the 1980's, but since then it has tapered off dramatically. Information is posted privately by each individual agency, and there seems to be little interdepartmental cooperation and a lack of an effective participation mechanism in order to express the opinions of the local communities.

4. Encourage the development of new interpretive materials on a wide range of

Pinelands topics, designed for a wide range of abilities and audiences, including school curricula from kindergarten through college.

As previously mentioned, the state of New Jersey only requires one, elementary-level course on New Jersey history for its residents. During the research process for this thesis, I found evidence that creative elementary school curricula was indeed created and disseminated, but there is no way to tell if it is still widely used and by whom. In addition, there was no indication that schools above the elementary level ever taught students about the Pine Barrens. From my personal experience as a student in New Jersey, I recall that the Pine Barrens was mentioned once in third grade and then never brought up again.

5. Relate the interpretation of Pinelands nature, history and culture to contemporary issues that affect the Pinelands, New Jersey, the nation and the world; remind the public that the Pinelands National Reserve is a ‘living landscape’ that is still evolving and not frozen in time.⁵¹

The interpretation of Pinelands nature has indeed been related to contemporary environmental issues that pose a threat to the landscape of the forest and of our nation, and people have rallied behind the environmental concerns of experts and residents. Still, historic and cultural interpretation has taken a back burner to the explanation of environmental threats. The “living landscape” of the Pinelands National Reserve is under threat from a whole slew of sources that threaten its natural and cultural resources, yet the suggestions for the conservation of heritage have been ignored.

Conclusion

Overall, these five goals have only been partially realized. The private-public partnership that has proven so successful in the protection of the ecology has failed to protect historic resources because there is no legal obligation to comply with the CRMP. Local governments must comply with the CMP when it comes to land use, but historic preservation is an entirely different story. Judging by past inventories and accounts of the former iron-making sites and the condition that I found many of them in over the past few months, I would say that most of the ruins which still stand will have crumbled within the

⁵¹ Pinelands Commission, “Cultural Resource Management Plan,” pg. #233.

next 25 years, unless more effort is made to record and understand them. Trinkets that litter the trails provide visitors with a tangible link to the past, and many are pocketed out of fascination, not thievery. Still, more steps should be taken to show the connection between the woods and the industry that created the forest landscape, for knowledge of the importance of leaving these items in situ might convince more people to leave things where they are.

Growing up in New Jersey, the only thing most people ever hear about the Pine Barrens is that the “Jersey Devil” will eat you if you go there. At best, people learn a little bit about the unique flora and fauna of the region in middle school. Overall, however, there is a surprising lack of knowledge about an area and an industry that was so crucial to the development of New Jersey and to the United States. Several proposed enhancements to the Preservation Area, including a signage overhaul, the placement of markers at historic corridors, and the restoration/stabilization of some of the remaining structures never materialized. Without a comprehensive effort to promote the iron-making sites and their history, they will disappear: from both the forest and from memory. The next chapter will provide an overview of the general condition of the iron-making sites and an analysis of the resource group as a whole.

Chapter 4: An Overview of Historic Iron-Related Resources that Remain in the Pinelands

Before field inspection began, a preliminary investigation was undertaken in order to determine the current state of preservation for the 25 iron forge and furnace sites sampled in this thesis. During that initial research process, it became clear that many of the sites I had chosen to analyze suffered from a severe lack of documentation. While some significant texts such as *Early Forges & Furnaces in New Jersey* by Charles S. Boyer provided helpful historic overviews and sometimes a brief mention of a site's condition, most of the resources I found were over fifty years old. As a result, I knew that field research and documentation had to be an integral part of my methodology.

After creating a dossier on the sites that I selected for this thesis, I began my fieldwork deep inside the Pinelands National Reserve. Using historic and current maps and descriptions from past researchers to guide me, I trudged through the silent forest taking photos, analyzing ruins, and interviewing passersby whenever I got the chance. The natural beauty of the Pine Barrens was often overwhelming, yet what I found most intriguing about my fieldwork was the scattered remains of industrial towns and villages that were never mentioned on any map or in any book that I had found. These remains hint at the depth of possibilities for preservation in the Pines. Ruins, artifacts, and manmade landscapes randomly and unexpectedly punctuate the vast expanse of wilderness, and even with little historic fabric the very *experience* of these sites is a valuable and redeeming aspect of the imperative to preserve culture in the Pinelands.

After each visit to the Pine Barrens, past depictions and photographs of these sites were compared to the results of the field research in order to comprehend the extent to which these historic resources have been eradicated. Field research was not always successful, and some sites were simply too elusive to find. However, through conversations with other explorers and an additional period of research, I was able to fill in the gaps for almost all of the sites sampled in this thesis. While there are several positive examples of preserved sites, for the most part there has been a general failure to protect these important historic resources. In order to further understand the condition of the iron forge and furnace sites, they have been divided into four distinct categories: Intact, Ruins, Archaeological, and Areas of Archaeological and Historic Potential.

Intact Sites: 2/25

Of all of the sites associated with the iron industry in the Pinelands, only Atsion and Batsto survive intact. Both villages were fairly prosperous throughout the 19th century, and they were acquired by the state as part of the Wharton purchase in 1954. While Atsion only has a few remaining buildings, they are architecturally diverse and some of the only standing structures in the resource group. Batsto is a popular and well-preserved site with dozens of original structures, including workers' houses. These sites have been categorized as "intact" because many of the different functional parts of the cultural landscape that existed when these sites were iron towns are legible.

The preservation and process of restoration of Atsion and Batsto can be attributed to a combination of luck and state intervention. Joseph Wharton initially acquired Atsion and

Batsto in the late 1870's when he was plotting to export the pure drinking water of the Pinelands to the city of Philadelphia. Once his plan was thwarted by the state of New Jersey, he instead decided to expand the agricultural capabilities and production of forest products at both sites. Atsion was used as both a farm and a planned community, and after the iron industry died out it produced cotton and peanuts. Batsto was the crown jewel of Wharton's Pinelands property holdings, and he made considerable changes to the village landscape. He expanded the mansion built by previous owner Jesse Richards and gave it a unique Italianate flair. Wharton also built several new structures, including a sawmill and a silo, and cleared large areas of land for the cultivation of crops, including cranberries.⁵²

Wharton was charmed by the landscape of the Pine Barrens, but there is little evidence to indicate that he was interested in the area's cultural resources. Almost all of the improvements made by Wharton were about profit and sustainability of industry, not the retention of unique sites or structures. Since Batsto and Atsion were converted to agricultural production centers following the fall of the iron business, they continued to be relevant and occupied even after Wharton's death in 1909. Residents were permitted to stay as long they desired, and the last remaining residents of Batsto left in 1989. As a result, they were spared a lengthy period of neglect that has proven the downfall of so many other Pinelands historic sites.

Batsto and Atsion are the only two sites associated with the iron industry that are administered by the state of New Jersey's Division of Parks and Forestry. This affords them certain administrative and financial benefits that many of the other sites do not have. Both sites are restored and marketed to tourists, and Atsion has a recreational and camping area

⁵² New Jersey Division of Parks and Forestry, *Historic Batsto Village* (Hammonton: Wharton State Forest, NJ).

located in close proximity to the historic structures that remain. While it is true that most of the villages associated with the iron industry had disappeared or fallen into disrepair decades before the state of New Jersey acquired the Wharton tract, those that could have been stabilized or at least recorded languished for decades in the forest (Figure 4.1).



Fig. 4.1: The interior of a ruined building at Atsion. Photo taken by author.

Sample Site: Batsto Village

Located off of Route 542 in Hammonton, NJ, Batsto Village is without a doubt the most well-preserved and visually striking off all the sites associated with the iron industry that still exist in the Pines. Approaching Batsto Village from the road, visitors are immediately drawn to the tower of Wharton's beautifully restored Italianate mansion, by far

the tallest structure in the village (Figure 4.2). After turning down a separate road, visitors are guided into a parking lot adjacent to a visitor's center. The parking lot is well suited and does not detract very much from the environment of the village. As a result, as soon as you have left the parking lot, you feel as though you have left the 21st century behind.



Fig 4.2: A view of the general store at Batsto Village, with the mansion's tower rising in the distance.
Photo taken by author.

The experience of Batsto Village is both haunting and thrilling at the same time. I arrived in late October about an hour before sunset, and I was one of only three cars in the entire parking lot. I made a beeline for the mansion, but soon I was distracted by the vast array of buildings scattered across the village. I stopped at the blacksmith and wheelwright shop, the icehouse and the general store. I examined the gristmill and the sawmill, Wharton's

19th century carp pond, and the post office (which still operates). Passing Batsto Lake and the site of the former iron furnace, I continued on to find two rows of 18th century village houses used to house the ironworkers, perfectly intact. Just beyond the village, the vast forest stretches for as far as the eye can see, and you could almost hear the hustle and bustle of the townspeople on their way to and from the furnace, black smoke rising the distance.

While there is little signage that exists at Batsto Village, there are free, guided tours and a cell phone guide that is very useful. The visitor's center houses a small museum and also a store, and there are numerous maps of the Pinelands National Reserve available for visitors to take with them. All in all, the site is a quiet, authentic place where visitors are encouraged to wander and explore at their own pace. The lack of expository material actually contributes to the overall experience of the site, because the visitor feels as though they have stumbled upon a secret, abandoned village that nobody else has seen before. Batsto Village is one of the few sites identified in this thesis where the state of New Jersey has done a terrific job in the retention of cultural and historic resources, and it is an excellent introduction to



historic iron making sites in the Pinelands (Figure 4.3).

Fig. 4.3:
A view of the horse stable (left) and pigery (center and right) at Batsto. The tower once contained a water tank to provide the pigs with fresh water.

Ruined Sites: 10/25⁵³

Ruins associated with iron forges and furnaces can be found scattered throughout the Wharton State Forest, crumbling reminders of an industry that forever shaped the landscape of the Pinelands. These ruins range from moss-covered brick arches to dilapidated stone walls and cellar pits, and they continue to survive despite the destructive power of the forest's vegetation (Figure 4.4). The dense and damaging forest has played a large part in the obliteration of many historic sites deep within the forest. As a result, wooden ruins are almost nonexistent. Stone and brick ruins appear in the Pine Barrens quite often, even in places where no map has ever recorded a town or industrial site. New Jersey's Division of Parks and Forestry has done very little to stabilize the ruins found in the Pine Barrens. To be fair, some of the sites which are categorized in this thesis as "ruins" are too small and damaged to do much with at all, but more thorough maintenance of the area's ruins in



general could prevent the loss of some truly intriguing sites.

Fig. 4.4:
Ruins found along to road to Martha.

⁵³ Initially, ruins and archaeological sites were lumped together into one category. However, upon further investigation of these sites as they exist today, I felt it necessary to separate the two into two distinct site typologies. While many of the sites where ruins remain would most likely yield important archaeological discoveries, some of the sites surveyed were clearly only valuable for archaeological reasons. As a result, while the two sometimes overlap, I have separated them for the purpose of being more precise.

Sample Site: Harrisville Paper Mill

Perhaps the most famous of all the ruins in the Pine Barrens associated with the iron industry are the remains of the Harrisville Paper Mill, built upon the same land that once housed the Waging River Forge and Slitting Mill. The paper mill was mostly destroyed by fire in 1914, but one large section of the structure remains. These ruins, located just off of New Jersey's Route 206, are easy to miss unless you are explicitly looking for them. There are no signs or parking lots, and one must brave the meandering stagecoach roads in order to explore the ruins and surrounding forest. In order to prevent damage to the unstable ruins, the Division of Parks and Forestry has installed a large green fence around them to keep curious visitors from getting too close. Still, the fence is quite easy to circumvent, and it might not serve as the best deterrent against would-be vandals. For research purposes, I did go around the fence, but I do not condone trespassing as anyone caught could potentially be fined a large sum of money.

At first glance, the ruins of the paper mill seem much older than they actually are. The destructive nature of the Pine Barrens landscape has aged the ruins so rapidly that they appear to be hundreds, if not thousands of years old. The landscape is dotted with small, crumbling foundation walls made of stone and brick and cellar pits where industrial buildings once stood. Towering over these ruins is a massive stone wall, the only standing portion of the paper mill building (Figure 4.5). The fenestration of the original structure can still be understood, and standing amidst the ruins one can get an idea of how large the original paper mill building was. Leaving the ruins, along a portion of the fence closest to the road, I stumbled upon a 19th-century well that was still functioning, its rusted tap spewing



Fig. 4.5: Ruins of the Harrisville paper mill. Photo courtesy Kevin Hooa.



Fig. 4.6: A 19th-century well
near the ruins.
Photo taken by author.

Leaving the ruins, I turned down a sand road in an attempt to find evidence of the village that once existed at Harrisville. About a quarter mile away from the ruins, I identified cellar pits and non-native plants that were likely indications of previous human settlement. Interestingly, the landscape around Harrisville is hilly, which is a stark contrast to the relative flatness of most of the Pine Barrens. The cellar pits I identified were clustered around two large hills, and it appeared as if the homes were dug into the hills themselves, as the lots were flat and surrounded on 3 sides by high earthen mounds. This curious village reminded me of somewhere that a hobbit might live, and I did not find anything else like it at any point during my field research.

Like most of the ruins in the Pinelands, the Harrisville paper mill site is plagued by a lack of signage. If visitors understood the importance and rarity of these and other ruins in the forest, they would further appreciate the unique historic resources that the Pine Barrens has to offer. While I do not feel that the state of New Jersey should market ruins as a tourist destination, it would be helpful to outfit several of the sites with simple signage explaining what the ruins are and why they are important.

Archaeological Sites-: 5/25

Trekking through the Pine Barrens, it is not uncommon to stumble upon relics from the period when the iron industry dominated the forest. Bog iron slag, shells, pottery shards, and glass bottles appear quite frequently. Many of the sites appear to be nothing more than small patches of cleared forest, but upon further investigation one finds artifacts hiding just beneath the subsoil. While many of the more noteworthy relics, including bars of pig iron,

cannonballs, firebacks and kitchen utensils have been plundered by private citizens or acquired by the state, many artifacts still remain scattered throughout the Pinelands. These archaeological resources could potentially yield a wealth of information about the people who settled in the Pine Barrens and the towns that long ago disappeared from maps. Archaeological sites are perhaps the most difficult type of site to “preserve” because they are mostly stratified repositories of artifacts several inches below the topsoil. Constant monitoring of these sites to ensure that they are not plundered is not only financially difficult, but also logistically impossible due to the immense size of the Pinelands National Reserve.

Although the true value of archaeological sites is often hidden from plain view, all of the sites categorized as “archaeological” in this thesis had evidence of archaeological material on the soil surface (Figure 4.7). This is not to say that litter and modern debris was taken as evidence of archaeological possibilities. Maps and written accounts of the former iron forge and furnace sites were analyzed before field research was conducted, and archaeological findings were then compared to available information for each site. Sites that contained archaeological material consistent with historical descriptions of the site’s location and history were then dubbed archaeologically valuable.



Fig. 4.7: One of many archaeological sites discovered along the Quaker Bridge Road.
Photo taken by author.

Sample Site: Martha Furnace

Martha Furnace, which operated from 1793-1848, is the most well known archaeological site associated with the iron industry, and it contains one of the only remaining blast furnaces in the entire Wharton State Forest (Figure 4.8). In 1910, a recording of all of the events that occurred at Martha Furnace from 1809-1815 was discovered in the safe at the Harrisville paper mill. This document, known as the *Martha Furnace Diary*, is the most insightful look into the day-to-day operations of the former forges and furnaces that has ever been uncovered. In 1968, under the direction of archaeologist

Budd Wilson, the furnace was completely excavated.⁵⁴ It was then documented and photographed, and all of its contents were collected and catalogued. To protect the integrity of the remains, the furnace was then completely covered with a mound of dirt. The mound is still visible to this day behind a large green fence topped with barbed wire, but it is so badly overgrown that there is very little to see at all. There is nothing in the vicinity of the mound to indicate its function or importance, and those with no prior knowledge of Martha Furnace must find the sight of a dirt mound protected by barbed wire a bit odd.

I approached Martha Furnace by foot after visiting the Harrisville paper mills ruins. Using past descriptions and a map of the site drawn several years ago, I was able to find it relatively quickly. The vegetation surrounding the mound that covers the furnace had become so overgrown that I could barely even make out the furnace site. Around the mound, cleared patches of earth and pieces of brick, pottery, glass and flux helped me to identify the sites of the ironmaster's mansion, the blacksmith's residence, and several smaller dwellings where the workers probably lived. The area surrounding Martha Furnace has a great amount of archaeological potential, yet nothing but the furnace site has been excavated. To make matters worse, information about the Martha excavation is extremely hard to come by, even in the digital age.

⁵⁴ McPhee, *The Pine Barrens*, pg. #27-30.



Fig. 4.8: The mound at Martha Furnace. Photo courtesy Kevin Hooa.

In order to ensure the survival of the archaeological iron-making sites that exist throughout the Pinelands, an investigation should be undertaken to determine which sites are the most important. The archaeological sites associated with Native American occupation of the Pinelands were documented long ago, and while many of them have not yet been excavated, they are still documented and kept by the New Jersey State Museum Bureau of Ethnology and Archaeology. As archaeological sites are in constant danger due to looting and vandalism, these records should be kept secure and only shared with researchers and ethnographers. Private citizens should have access to the records, but only for educational or scientific purposes.

Areas of Archaeological and Historic Potential: 8/25

Of the twenty-five sites sampled in this thesis, eight of them have been completely eradicated. The forest has reclaimed these areas of archaeological and historic potential, and little documentation exists to shed light on their original location. Historic maps are scarce, and sites that are mentioned in historic documents one year have vanished by the next. Although artifacts and ruins might potentially be uncovered at some of these lost sites, they cannot be categorized as archaeological when their exact location is a mystery. Still, this group of sites is useful to include because there is a possibility that their whereabouts can actually be determined, potentially yielding artifacts and new information about the history of the iron industry in the Pinelands. However, until more research is conducted on the history and whereabouts of these sites, they will remain lost deep within the Pinelands. Additional information regarding areas of archaeological and historic potential can be found in Appendix A.

Sample Site: Lower Forge

Lower Forge Campground, about eight miles downriver from Batsto, was once the site of Phoenix Forge, which was already identified on maps as “ruins” by 1855. My research yielded very little information about Phoenix Forge, and I did not expect to find anything of interest when I visited the site of the former forge in mid-November of 2011. However, to my surprise, I stumbled upon evidence of the forge and a village that existed near it just a an eighth of a mile away from the campground. In one patch of cleared forest near some cellar pits, I noticed hundreds of pieces of glass in various shapes, sizes, and colors that I initially

presumed to be rubbish left by careless campers. However, upon further inspection, I realized that although landscape was indeed a trash heap, all of the trash was from the beginning of the 20th-century and earlier (Figure 4.9). There were Coca-Cola bottles from the 1910's, brown and blue apothecary jars, smashed bits of terracotta pottery and shards of beautiful porcelain decorated with colonial scenery. One particularly special piece of peach-colored glass was decorated with carved elephants, and it appeared to be expensive. This notable discovery hints at the archaeological potential of the area around Lower Forge, and at the potential of the seven other sites identified as areas of archaeological and historic importance in this thesis.



Fig. 4.9: Close-up of debris found in the “trash heap.”
There were hundreds of other pieces embedded in the soil. Photo taken by author.

Conclusion

Overall, this resource group as a whole is in extremely bad condition. Only two of the twenty-five sites sampled remain intact, and a third of them have been completely forgotten. The future of the physical remnants of the iron industry in the Pine Barrens depends on a more aggressive education strategy, as well as a comprehensive sweep of the resource group. As the former iron forge and furnace sites are quickly being eradicated due to nature and neglect, documentation of these sites will at least preserve their importance in writing. While the decay of the built environment in the Pinelands has contributed to the destruction of the resource group as a whole, the erosion of the landscape itself has also proven detrimental. In the next chapter, an examination of the issues regarding the resource groups' cultural landscape will further highlight the destruction of the iron-making sites.

Chapter 5: Erosion of the Cultural Landscape and its Negative Effect on the Historic Preservation of the Iron Forge and Furnace Resource Group

This chapter will discuss the cultural landscapes associated with the iron industry and assess the factors that threaten their survival. In essence, the term *cultural landscape* refers to any site or area where human beings have interacted with the natural environment. Cultural landscapes are not easy to classify, for scenic resources only become “scenic” when seen by someone who appreciates them. What qualifies as “scenery” is subjective, and it would therefore be inaccurate to suggest that the cultural landscapes associated with the iron-making industry are the most significant in the Pinelands.⁵⁵ Still, the retention of these cultural landscapes contributes to our understanding of the resource group as a whole, and as the sites addressed in this thesis are predominantly void of physical fabric, the preservation of their broader cultural landscapes is essential. In fact, as the state has been unable to protect historic sites through preservation law, framing preservation in the Pine Barrens around the conservation of cultural landscapes could be an easier way for the state to protect historic resources and balance the protection of nature and culture.

Cultural Landscapes Associated with the Iron Industry

Humans have occupied the Pine Barrens for over 10,000 years, and as a result there are numerous cultural landscapes found throughout the forest. As part of the development of the Pinelands Commissions’ Comprehensive Management Plan, a study was undertaken in 1980 to categorize all of the cultural and natural landscapes of the Pine Barrens. The

⁵⁵ Ricki L. McKenzie, *The Pinelands Scenic Study: Summary Report* (Trenton: HCRS, 1980), pg. #4.

Pinelands Scenic Study ultimately identified twenty-six cultural landscapes in the region, and after categorizing these landscapes the Commission attempted to reach out to residents of the Pinelands and determine which ones were considered most important. Of all of the cultural landscapes presented to the public, the study found that residents' of the Pine Barrens most preferred stream banks with scattered old buildings (Figure 5.1).⁵⁶ While most of the industries that thrived in the forest depended on waterpower to drive their machinery, it was the iron industry that had the greatest impact on the cultural landscape.



Fig. 5.1: A stream bank with scattered old buildings in the Pine Barrens. Photo courtesy Kevin Hooa.

Early settlers used the serpentine network of rivers and streams that cuts across the Pine Barrens to transport or smuggle goods east, eventually arriving at the Atlantic Ocean. To the west, settlers dammed streams and harnessed the power of water to turn saws and

⁵⁶ McKenzie, *The Pinelands Scenic Study: Summary Report*, pg. #15.

grinding stones for lumberyards and gristmills.⁵⁷ The iron industry dammed streams to work the bellows used in the production of iron at blast furnaces. As the industry grew, more people moved to the area and often settled at millponds that were created when streams and rivers were dammed. Forges and furnaces were located in close proximity to each other, and most forges were located close to the riverbanks in order to easily transport the pig iron from the furnace.

Of the 25 sites studied in this thesis, 17 of them retain their integrity as cultural landscapes because their spatial layout, ruins, surface material and siting along waterways all clearly indicate the former existence of an iron village.⁵⁸ Even though most of their physical integrity has been compromised, their impact on the land can still be seen. Giving priority protection to cultural landscapes could help to mitigate the destruction of archaeological and historic resources under the umbrella of landscape conservation or stricter land-use regulations. Even though the Pinelands Commission identified the “stream with scattered old buildings” to be the most revered type of cultural landscape, there are several others that I think are worth mentioning. These other cultural landscapes associated with the iron industry in the Pinelands include:

- **Stagecoach roads** (Figure 5.2)- the establishment of the iron industry in the Pinelands led to the creation of an immense network of sand roads that cross the Wharton State Forest in every direction. Iron ore slag and shells, two components crucial to the production of iron, are commonly found on these roads. Stagecoach roads often pass by or go directly through the ruins of villages associated with the

⁵⁷ *The Pinelands Scenic Study*, pg #15.

⁵⁸ Although the 8 areas of archaeological and historic potential are valuable assets to the resource group, too little is known about them to assess the intactness of their cultural landscapes.

iron industry. This landscape is currently stable, yet increased automobile and ATV traffic could pose a threat to its survival.



Fig. 5.2: A typical stagecoach road in the Pine Barrens. Photo taken by author.

- **Raceways** (Figure 5.3)- channels cut into the land called “raceways” diverted water from rivers in the Pinelands to iron forges, where it was used to power smelting machinery.⁵⁹ These gashes in the landscape speak to the industry’s affect on the Pinelands, and can be used to determine the location of historic sites. Overall, the raceway landscape is stable.

⁵⁹ Pierce, *Iron in the Pines*, pg. #11.



Fig. 5.3: A raceway at the former site of Walkers Forge. Photo courtesy Kevin Hooa.

- **Land Clearings with Non-Native Vegetation** - cleared parcels of land bordered by non-native plants are indicators of human occupation. Many areas associated with the iron industry contain evidence of workers' homes and buildings erected to aid in the production of iron. Invasive plant species and looting threaten the survival of this landscape.

Current Threats

The retention of the “streambank with old buildings” cultural landscape type is important not only because it was identified as the preferred type of Pine Barrens’ residents, but also because it is the most important type of landscape associated with industry that can still be found in the forest. While the CMP did take the findings of the *Pinelands Scenic Study* into account when determining the nine land-use types that constitute the Preservation and Protection Areas, numerous issues have arisen since it was first published in 1981. As a result, valuable resources have been threatened for over three decades. Of all of the issues that currently threaten the cultural landscapes of the Preservation Area, four problems in particular have proven particularly detrimental to their preservation: the development of recreational areas, the extraction of natural resources, ineffective habitat restoration and arson.

The Development of Recreational Areas

The development of recreational areas in the Pine Barrens over the past thirty years has adversely impacted the preservation of historic sites throughout the region in several ways. In the Wharton State Forest, the establishment of more than ten campgrounds in the area has caused a dramatic increase in the number of visitors to the forest, resulting in the erosion of both natural and cultural resources. Over 18 million visitors visit the Pine Barrens every year, and as of 2011 there were only 20 permanent park superintendents to manage recreational areas, historic structures, and other facilities spread over an area comprised of more than 600,000 acres. Over 1,900 structures throughout the region are becoming

“unmanageable” due to dramatic reduction in maintenance staff.⁶⁰ While there are a large number of seasonal workers that patrol the Pinelands from May until September, for the remainder of the year most of the area is unprotected, and the state of New Jersey continues to add more and more acreage to its holdings. As one scholar remarked on the current state of land preservation in the Pine Barrens: “when will enough acres be preserved?”⁶¹

The increase of visitors to the Pine Barrens and lack of park employees to patrol the forest has undoubtedly contributed to the eradication of natural and historic resources in the region. While investigating the Pinelands, I saw naturalists pocketing artifacts, hunters during offseason, and widespread evidence of partying and vandalism. The existence of recreational areas and the promotion of the Pinelands as a place of great natural and cultural importance are both worthy endeavors, but without an increase in the number of people to enforce the rules and regulations of the forest, there is a greater risk that important sites and landscapes will be damaged (Figure 5.4). Consider the following excerpt from a Philadelphia Inquirer article from October 24, 2010:

It's a trashed expanse of ruts and puddles, a disturbed - and disturbing - moonscape in the midst of Wharton State Forest. Welcome to what some fans of four-wheeling call "The Quarter Mile" and what photographer Albert D. Horner and others call "The Scar." This once-lush, now-denuded section of the supposedly protected-in-perpetuity Pinelands National Reserve has morphed into something like a private playground, one where some visitors leave behind smoldering fires, moldering heaps of cheap-beer cans, and environmental desolation. Rare plants? Endangered species? The rights of the rest of us? Details, details.⁶²

⁶⁰ United States of America, Department of Environmental Protection, *Sustainable Funding Strategy for New Jersey State Parks*, November 2011, Key Findings to Date.

⁶¹ Thomas L. Daniels, "Land Preservation in New York, New Jersey, and Pennsylvania: Strategy, Funding and Cooperation Are Key," diss., University of Pennsylvania, 2005, Common Themes.

⁶² Kevin Riordan, "Concern over Irresponsible Off-roaders in Pinelands," *The Philadelphia Inquirer*, August 24, 2010.



Fig. 5.4: Aerial view of the “scar” on the Pine Barrens. Photo courtesy Bing Maps.

The destruction of the Wharton State Forest at the hands of reckless visitors has become unmanageable by the Departments of Parks and Forest, and new solutions should be sought to ensure that the forest is protected.

While the Pinelands Commission could never have foreseen how the rise of the digital age and the instantaneous spread of information could contribute to the destruction of historic and natural resources in the Pinelands, online blogs and magazines such as *Weird N.J.* have only amplified the fascination with historic resources, and often give directions on exactly how to access them. Although dissemination of information regarding these sites is important to their survival, there are some regrettable side effects associated with full disclosure. The key to their preservation lies in underscoring their historic significance and rarity, and stressing the importance of how fragile these resources are. Still, without an

adequate supply of park rangers to regulate the Wharton State Forest, those who wish to use the area for reprehensible purposes will continue to roam unchecked.

The Extraction of Natural Resources

Another issue facing the preservation of the iron industry's cultural landscape is the need for resource acquisition. While the area has long been used for the cultivation of a variety of natural resources, no other resource has been more exploited than timber. Over the past four centuries, thousands of acres of the forest have been destroyed in order to satisfy the seemingly insatiable resource needs of the United States. Historically, colonial settlers attempted to work with the regenerative nature of the pine forests in the region, cutting wood from different plots of land every few years to ensure that there would always be a place to obtain timber. Even then, however, many forges quickly ran out of lumber, and then went out of business as a result.⁶³ While the Pine Barrens is fairly segregated as far as industrial uses go, the acquisition of timber is permitted in nearly every one of the nine land-use types, including the Preservation Area.

Currently, a bill entitled "Forest Harvest on State Lands" (S1954/A4358) is causing a lot of controversy in the state of New Jersey. If passed, the bill would allow large-scale commercial logging of resources on land held in the public trust. This is one of the most imminent dangers facing the iron industry resource group today. The bill would also cost \$2.7 million to implement, and as the average tree goes for \$60-70 on today's market, tens of thousands of acres of the Pinelands would have to be obliterated for the state of New

⁶³ McPhee, *The Pine Barrens*, pg. #35.

Jersey to make a profit.⁶⁴

The logging of timber in the forest would contribute to the destruction of cultural landscapes associated with the iron industry in numerous ways. First, unchecked logging would contribute to the Pine Barrens' rampant deer population by creating more sun-filled grazing areas, forcing the state to allow more periods of open deer hunting, which would in turn attract more hunters with trucks and SUV's deep into the forest. Open spaces or clearings created by logging and automobiles contribute to the spread of invasive plants, which in turn prevent new trees from being able to establish themselves, thus altering the unique ecological balance in the Pine Barrens and contributing to eradication of ruins and archaeological material. Clearings or cellar pits that were once evidence of human occupation will quickly become choked with non-native weeds, and sooner or later many of the sites identified in this thesis will go from being classified as "archaeological resources" or "ruins" to "lost." Overall, the unchecked and unplanned logging of timber in the Pine Barrens would make it even more difficult to preserve heritage and cultural landscapes in the region.

Ineffective Habitat Restoration

The Comprehensive Management Plan and many of the studies that emanated therefrom stressed the importance of habitat restoration for the numerous plant species that exist in the Pine Barrens. The region contains an exceptional number of rare specimens that have been studied by botanists for decades, yet there are few protections in place to make the destruction or plundering of said specimens illegal. Non-native species introduced by

⁶⁴ Michele S. Byers, "No Economic or Ecological Sense in Logging State Lands," *New Jersey Conservation Foundation*, December 16, 2011.

colonial settlers also survive in the Pinelands, and they are important because they can be used to identify the location of historic settlements that are otherwise invisible.

Unfortunately, over a third of all native plant species in the Pine Barrens are in danger of extinction, and many are found in the Wharton State Forest (Figure 5.5).

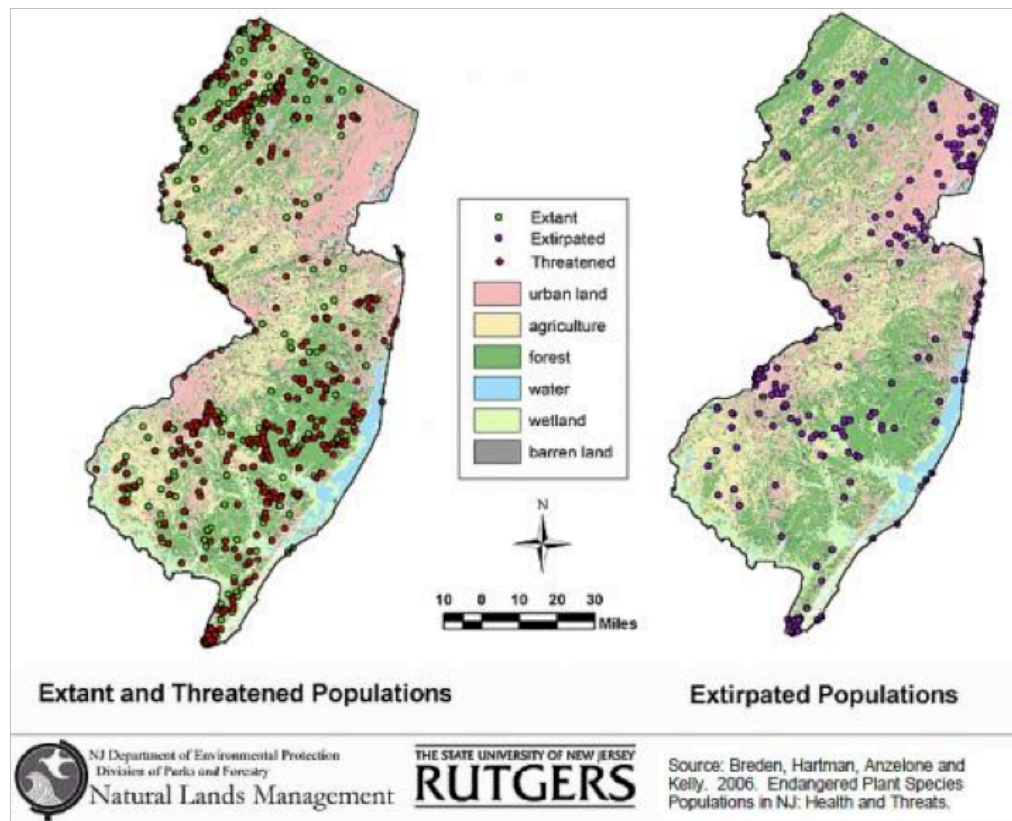


Fig. 5.5: A map of extant, extirpated, and threatened plant species in the Pine Barrens.
Map courtesy Rutgers University.

The introduction of invasive plants is largely to blame for the destruction of native species and their habitats, and development and recreation also contribute to their annihilation. To make matters worse, the logging industry creates vast patches of open land that allow invasive plants to spread. While the state of New Jersey cannot be expected to oversee every last plant that exists in the Pinelands, it should at least take action to legally

protect native plant species, and also devise a plan for to combat invasive plants. Landscape “disturbances,” essentially any event that disrupts resources, the substrate, or the physical environment, should be monitored in order to mitigate their negative affects on the cultural landscapes of the Pine Barrens. All ecosystems have a natural ability to adapt to “disturbance regimes,” or periods of disturbance, but the rare plants of the Pine Barrens are under attack from several fronts, and therefore they must be afforded immediate protection.

Arson

Of all the destructive forces that currently threaten the erosion of the iron industry’s cultural landscape, perhaps none is more dangerous than fire. Controlled burning of the forest has been practiced by native inhabitants since the time of the Lenni Lenape, and was continued by colonial settlers in order to encourage regeneration of blueberry bushes, to produce charcoal, or just to get even with their enemies. Natural and controlled burns in the Pine Barrens contribute to mature tree growth and maintain a high number of pitch pine trees, which have become highly resistant to fire over the centuries. Fire is an essential, “natural” part of the Pine Barrens ecology.

Unfortunately, arson has become a major problem in the Pine Barrens over the past hundred years.⁶⁵ Several past explorers of the sites sampled in this thesis note the loss of buildings due to fire in their reports. As the region is largely uninhabited and unpatrolled, it is particularly attractive to pyromaniacs and vulnerable to the carelessness of visitors. While the Pine Barrens depends on forest fires to maintain its unique landscape and encourage healthy growth, arson threatens the unique cultural landscape of the iron industry and what

⁶⁵ McPhee, *The Pine Barrens*, pg #100.

precious little physical fabric remains. Disturbance regimes of destructive fires in the Pines should be studied in order to determine a proper course of action for the prevention of arson.

Conclusion

The state of New Jersey is the steward of the Wharton State Forest, and its open-door policy has caused problems that it does not have the means to solve. Free and unlimited public access to the forest has negatively impacted the Pine Barrens in numerous ways, and the state is unable to police the entire area. If the forest continues to erode at its current state, then the state of New Jersey might have no choice but to further limit the land uses defined in the CMP. While Chapters 4 and 5 highlighted the current threats facing the iron forge and furnace sites, Chapter 6 will provide recommendations in order to ensure their survival.

Chapter 6: Recommendations

The Pinelands Commissions' Comprehensive Management Plan was a remarkable attempt to protect the Pine Barrens, the United States' very first national reserve. While it has proven overall to be successful in retaining the region's unique natural environment, it has failed to properly guide the practice of historic preservation and cultural resource management in the region. The Cultural Resource Management Plan is also well developed, yet it is merely a list of recommendations, and it has no regulatory or legal power. The dwindling resources available for historic preservation in the state of New Jersey is regrettable, but the situation is not totally hopeless. This chapter will offer recommendations to remedy the flaws identified in the CMP and CRMP, and to help the state of New Jersey utilize new methods of preservation to combat the complete erasure of the iron forge and furnace sites discussed in this thesis. Each recommendation is accompanied by a rationale, comparable study, and suggested methodology.

Recommendation #1

- A thorough documentation of historic and archaeological resources throughout the Preservation Area should be undertaken.

Rationale

- This is perhaps the most important of all the recommendations made in this thesis. If the Pinelands Commission and the state of New Jersey do not move quickly, all traces of industry in the forest will soon be eradicated. Although any type of documentation project will not yield an abundance of architectural information, as

most of the resource group's physical fabric has been destroyed, a HABS/HAER type of effort in the Pine Barrens would help to retain important archaeological and historical information about the period of industry in the region.

Comparable

- In 1987, the state of Pennsylvania teamed with the National Park Service to document historic engineering works and industrial resources associated with the steel industry in "America's Industrial Heritage Project (AHIP)." A Commission appointed by Congress oversaw this intensive documentation process, and it pooled resources from federal, state, and local governments in order to survive. AIHP successfully documented an abundance of industrial sites in southwestern Pennsylvania, even when faced with land ownership issues and difficulties securing funding.⁶⁶ The state of New Jersey owns most of the land in the Preservation Area already, so any survey would likely meet with little or no opposition from potential private landowners. In addition, the Pinelands Commission is well organized and could continue the documentation process even after the NPS and the federal government had stepped out.

Methodology

- The Pinelands Commission should seek outside assistance for initial funding and guidance of any intensive documentation project. The state government could provide initial funds for the development of an overall framework, and local and national government could be called upon to provide additional funding for the

⁶⁶ United States of America, General Accounting Office, Resources, Community and Economic Development Division, *Scope and Cost of America's Industrial Heritage Project Need to Be Defined* (Washington, D.C., 1993).

project itself. The National Park Service is the obvious partner for the documentation of the Pinelands, but the Commission must demonstrate to the NPS that it is capable of maintaining the project even when federal funds and assistance have gone away. A subcommittee should be appointed to begin the documentation project and make priority recommendations and general observations before any federal funding is sought. From there, the Commission should report its findings to the state of New Jersey and attempt to garner support for the project. Social media could be utilized to quickly disseminate information. The documentation project should be digitized and completely accessible online, except for information pertaining to rare and fragile archaeological or historic resources.

Recommendation #2:

- The creation of an all-encompassing digital database of photographs, art and illustrations, manuscript materials, primary, secondary and tertiary sources, etc., where people could conduct research into historic sites associated with the iron industry (and industry in general) in the Pinelands.

Rationale

- Overall, there is a surprising lack of information about historic resources in the Pinelands available to the public. Local municipalities are charged with the dissemination of information regarding cultural resources and historic sites, and many of them have never published or digitized knowledge that they have obtained over the years. An online database should be created to hold the findings of each of the seven Pinelands counties.

Comparable

- Created by Pine Barrens enthusiast Ben Leech in 2002, the single most valuable online database regarding the historic and cultural resources of the Pine Barrens that currently exists is called NJPineBarrens. Over the past ten years, submissions from other interested parties have caused Leech's website and database to swell enormously, and there is even more knowledge to be gained by perusing the open forums where people from all over the state share information about the Pines. Leech's website is easy to understand, well designed, and enriched by its open platform which encourages public submission. Its contributors are a tight-knit community who wish to protect the important cultural resources of the forest, and posts are careful not to reveal the exact location of at-risk sites. Overall, the database is a prime example of the immense interest in this resource group, and it should serve as a model for the Pinelands Commission.

Methodology

- The Pinelands Commission should oversee the creation of an online database and establish clear and simple guidelines for the submission of archival material. Public participation should also be encouraged, as private holdings could enrich the body of information available about historic sites in the Pinelands. The Pinelands Commission already has a clear and well developed website, and could simply add a database on historic sites to the webpage's existing frame. As the establishment of a database would only require scanning and typing of existing information, the

Commission would not immediately need to seek outside funds for the purpose of additional research.

Recommendation #3

- The establishment of “virtual tours” in order to promote interest in the region yet prevent increased visitation and subsequent looting and destruction of historic sites.

Rationale

- Building off of the documentation project and establishment of a virtual database of information, the Commission should then seek to virtually “recreate” historic sites in the Pine Barrens. A digital reconstruction of lost buildings and structures would better explain the industrial processes used at furnace and forge sites, as well as glass works and other factories, than actual visitation to sites like Batsto, where tours are mostly self-guided. In addition to being extremely cost effective, virtual tours would allow the state to “rebuild,” albeit in digital form, those buildings already lost due to the government’s neglect. Devices such as the iPhone could be utilized to provide a thorough understanding of the spatial arrangement and architecture of former forge and furnace sites in real time, and virtual tours would alleviate some of the heavy use that has proven detrimental to preservation in the region.

Comparable

- Saint-Gaudens National Historic Site in New Hampshire allows visitors to tour the home, studio, and gardens of Augustus Saint-Gaudens, one of America’s most beloved sculptors. Several years ago, Saint-Gaudens NHS developed one of the first

iPhone/iPad apps for historic sites in the nation, and it provides audio tours, a trail guide, and information about Gauden's artwork and sculptures.⁶⁷ Although the Pine Barrens is much larger than Gauden's estate, the idea of using new technology to inform visitors about the rich history of the forest and provide 3-D reconstructions of buildings could prove immensely successful. Trail guides could draw tourists away from areas which are known to be physically fragile, and direct them towards sites that are in less imminent danger of destruction. Audio tours could enhance the experience of the entire forest, and would be a way to spread expository information without investing in expensive weatherproof signage.

Methodology

- Virtual reconstruction cannot be achieved without a massive documentation project, yet the Commission and the local historical commissions of the seven Pinelands counties already possess enough historical information to begin the project. Martha Furnace, one of the best-documented sites in the entire resource group, should be used as a "sample" site to test the feasibility of virtual reconstruction. The spatial layout of Martha is already known, and written depictions of the town are numerous. A skilled intern with the Commission could easily complete the initial virtual reconstruction.

⁶⁷ "iPhone App and Cell Phone Tours," National Parks Service, accessed March 01, 2012, <http://www.nps.gov/saga/planyourvisit/iphone-app-and-cell-phone-tours.htm>.

Recommendation #4

- The establishment of a new advocacy group specifically focused on historic and cultural resources.

Rationale

- While groups such Preservation New Jersey, the New Jersey Conservation Foundation and the Pinelands Preservation Alliance are all fulfilling the role of advocates, they do not yield enough power and influence to effect change on the status quo. In addition, much like the Pinelands Commission, these three groups mostly advocate for the preservation of natural resources. The PPA, for example, did not even begin to advocate for the preservation of cultural resources prior to four years ago, despite the organization's existence for the last 22 years. A new advocacy group consisting of volunteers and professionals should be established to bring attention to the region's rapidly vanishing cultural resources. This group could inform the Pinelands Commission on cultural resource management issues and also serve as a watchdog to ensure preservation issues are no longer ignored.

Comparable

- Public-private approaches to preservation and cultural resource management have proven successful in cities and towns all over the world. One such example of a successful private-public partnership is the California Cultural Resources Preservation Alliance. This nongovernmental entity is comprised of laypeople, preservationists, American Indians, and scientific communities who advocate for the preservation of archaeological sites and other cultural resources in the state of

California. The CCRPA promotes stewardship programs, provides preservation consultation services, and works with local agencies and planners to inform them of preservation opportunities in the area. In addition, the CCRPA works in areas that are mostly of archaeological significance, much like an organization in the Pinelands would.⁶⁸

Methodology

- As the Pinelands Commission cannot forcibly create a cultural resource preservation alliance, it should instead attempt to generate interest in the forest's unique cultural resources and appeal to the emotions of New Jersey citizens. The Commission and other established organizations concerned with the protection of the Pinelands should encourage the development of new organizations concerned with cultural resource preservation, and offer logistical support whenever possible.

Recommendation #5

- A tenth land use group, specifically recognizing Pinelands historic and archaeological sites, should be added to the CMP to aid in the identification and understanding of cultural resources within the forest.

Rationale

- The establishment of nine land-use types established in the Comprehensive Management Plan was a useful attempt to divide the Pinelands into distinct regulatory districts. Unfortunately, save for the "Pinelands Village" type, historic and

⁶⁸ "California Cultural Resources Preservation Alliance, Inc.," CCRPA.com, About Us, accessed March 03, 2012.

archaeological resources were never identified. A tenth land-use group specifically emphasizing these resources would aid in the regulation of development and could also contribute to the designation of a “Preservation District,” either of cultural landscapes or archaeological features. The addition of a tenth land-use group would not require any modifications to the stipulations that govern the other nine types, but it could offer new protections not already inherent in the CMP.

Comparable

- When Utah’s Bureau of Land Management determines that special intervention is needed to protect archaeological or cultural resources on public land, it designates them as Areas of Critical Environmental Concern (ACEC).⁶⁹ This special protection is only afforded to sites of significant value, and the resources at risk must be considered important on a statewide or national level. The iron industry forever altered the natural and cultural landscape of New Jersey, and it also played an important part in the struggle for American independence. As a result, all of the sites associated with the iron industry are worthy of designation as areas of critical importance.

Methodology

- First published in December of 2007 by the Department of Planning and Land Use, San Diego, California’s *Guidelines for Determining Significance of Cultural Resources* is an exemplary document that could aid the Pinelands Commission in defining areas

⁶⁹ "Areas of Critical Environmental Concern," United States Department of the Interior, Department of Land Management, accessed February 24, 2012, http://www.blm.gov/ut/st/en/fo/st__george/blm_special_areas/areas_of_critical.html.

where archaeological and historic resources exist. After determining these areas of significance, the Pinelands Commission should establish a tenth land use group called Areas of Historic and Archaeological Significance. This new land use group should have even greater development restrictions than the other nine do, and logging of these areas should be completely forbidden.⁷⁰

Recommendation #6

- Strict regulations governing the use of Off-Road Vehicles (ORV) should be established to prevent further destruction of the stagecoach roads and cleared patches of forest that comprise part of the Pine Barrens' post-industrial landscape. Ideally, ORV should be completely forbidden in the Preservation Area.

Rationale

- The increased popularity of ORV has led to incredible destruction of the forest landscape. According to the Pinelands Preservation Alliance, ORV have already damaged more than 300,000 acres of the Pine Barrens, costing New Jersey taxpayers over \$1,000,000 a year in damages.⁷¹ This destruction occurs on both private and public land, and there is currently no legislation on the books to protect the Pinelands from ORV.

⁷⁰ California, Department of Land Use and Planning, *Guidelines for Determining Significance of Cultural and Historic Resources* (San Diego, 2007), accessed February 27, 2012, http://www.sdcounty.ca.gov/dplu/docs/Cultural_Guidelines.pdf.

⁷¹ "Off-Road Vehicles," Pinelands Preservation Alliance, Current Issues, accessed April 3, 2012, <http://www.pinelandsalliance.org/protection/work/currentissues/ecological/offroadvehicles/>.

Comparable

- The rise in popularity of the use of snowmobiles in Yellowstone National Park has caused environmental destruction just like the use of ORV has in the Pine Barrens. Although snowmobiles were banned from Yellowstone in 2001, the ruling was overturned just two years later, and since then opponents and proponents of snowmobile use have been engaged in a litigious showdown. The real question lies in whether national parks were created to be places of recreation or places of natural preservation. In my opinion, national parks are more for the enjoyment of the people, yet the Pinelands is different because it is a national *reserve*, specifically created by Congress to preserve the area's unique natural properties. As a result, I do not believe there should be any debate as to whether the Pine Barrens is more important as a natural preserve or a recreational area. The state of New Jersey has decided to create an "ORV Park" to contain the obliteration of the forest, yet its Department of Environmental Protection has failed to acquiesce a piece of state-owned land for the creation of said park. Until the ORV Park is established, a law requiring ORV owners to register their vehicles and display license plates cannot legally be enforced. As a result, the Pine Barrens continues to be trashed at an alarming rate.

Methodology

- The state of Pennsylvania has tried ORV Parks, and ultimately discovered that they do not do very much at all to stem illegal riding. It is my opinion that the ORV Park idea should be completely abandoned. ORV should be completely banned from

Preservation Area, and anyone found riding one should be fined.

Recommendation #7

- Halt the exploitation of the forest's timber resources or practice sustainable harvesting.

Rationale

- The unsustainable lumber industry is ruining thousands of acres of the Pinelands each year, and poses a threat to the resources and landscapes that still exist within the region.

Comparable

- Olympic National Forest in Washington State has had a large problem with illegal wood poachers for the past several years. The forest is divided into zones much like the Pine Barrens, and each zone has specific uses that are forbidden. Residents are allowed to legally harvest lumber from certain zones with a permit, but forest officials have noticed that many people are illegally gathering wood from restricted areas. The forest's immense size makes it difficult to police, just like in the Pines, and officials say that most of the illegal harvesting is coming from people who actually have permits and know what the boundaries are.⁷² This unfortunate occurrence in Washington hints at the difficulties in enforcing sustainable harvesting. Although the landscape must be open to change, I believe that commercial logging in the Pine Barrens should be forbidden.

⁷² Paul Gottlieb, "National Forest Firewood Ban Mulled as Thefts Increase," *Peninsula Daily News*, February 27, 2009.

Methodology

- Inhabitants of the Pinelands who depend on the felling of trees to make a living should continue to be able to do so. Larger operations, however, should either have their quota capped or be banned completely. As the development of industry is largely decided by local municipalities, a statewide law should be passed placing a moratorium on lumber production exclusively in the Preservation Area. Private landowners would be encouraged to comply, but could not be forced to do so. The landscape cannot and should not be frozen in time, but a process of more responsible logging should be implemented help the complete eradication of unique natural landscapes.

Recommendation #8

- The Pinelands Commission and the state of New Jersey should consider landscape stewardship as a means of combating the loss of unique natural and cultural resources in the Wharton State Forest.

Rationale

- The immense size of the Pine Barrens makes it impossible for the state to oversee and protect all of the region's unique features. The Commission should identify priority areas and work with State, Federal, and nongovernmental organizations to form coalitions dedicated to reversing the loss of certain resources in the Pinelands. Local stakeholders and landowners should be invited to be a part of the process. Coupled with the establishment of a new advocacy group, landscape stewardship could ease

the burden placed on the Commission and create an affective participation mechanism to gauge the priorities of local communities.

Comparable

- The New Jersey Audobon Society has been advocating for the conservation of unique natural and cultural landscapes since 1897. While the Audobon Society recognizes that the Garden State Land Trust has done an excellent job at acquiring land, it believes that the state of New Jersey has not done a good job at preserving the land or appropriately managing its cultural resources. As a result, the Audobon Society provides “outreach and technical assistance” to assist in its goal of “maintaining, restoring and enhancing native environments.”⁷³ It assists both public and private citizens and helps to ensure that they have the proper funding and tools to be successful stewards of the land.⁷⁴

Methodology

- The Pinelands Commission should work closely with the New Jersey Audubon Society and similar organizations to find stewards for portions of the land that it cannot police or even maintain. The Commission should not bear the sole responsibility of maintenance of over 1.1 million acres of forest, and should immediately seek partners to assist it in the retention of natural and cultural resources. Much like the Audubon Society, the Commission could provide logistical support and secure funding for public and private landowners to successfully maintain the land.

⁷³ "Why We Are Never Finished 'Saving' Land," New Jersey Audubon Society, Conservation, accessed April 2, 2012, <http://www.njaudubon.org>.

⁷⁴ Ibid.

Recommendation #9

- Carry out a complete interpretive overhaul of the region.

Rationale

- Overall, there is a lack of expository signage throughout the Pinelands. On the one hand, the lack of signage prevents would-be vandals and thieves from identifying historic sites. On the other hand, it also prevents those who have a genuine interest in the region from learning more about cultural resources. Signs could be placed at heavily trafficked areas that discuss historic sites in the forest without explicitly stating their location. In fact, simple signage discouraging the removal of artifacts might make visitors think twice before disturbing important resources. The establishment of a historic site trail could also be used to show off unique sites while directing visitors away from sites that should remain undisturbed.

Comparable

- The signage at Batsto and Atsion is minimal, but it provides a good overview of these two sites and has maps that indicate the existence of structures that no longer exist. The signage does not discourage self-exploration nor does it take away from the overall experience of the site. Although permanent, weatherproof signage would be a foolish purchase for many of the sites identified in this thesis, more simplistic signage could be created in order to provide a sense of cohesion for historic preservation practices in the forest.

Methodology

- A signage overhaul would undoubtedly be expensive, but modifications could be made to existing signage at Batsto and Atsion to better represent the region without spending a lot of money. A historic site trail would be incredibly easy to create, for all that it really requires is the painting of X's on trees.

Recommendation #10

- Consider a completely new approach to advocacy and education.

Rationale

- While the physical evidence of the iron industry in the Pinelands is quickly disappearing, the erasure of the resource group from memory is ultimately more disturbing. Although the Pinelands Commission has developed educational programs and school curricula for students from kindergarten to college, New Jersey only requires one, one-year course in state history, usually taught in the third or fourth grade of elementary school. As a result, most of the time and effort spent on educational programs has essentially proven fruitless. Older members of the Commission and the Pinelands Alliance have expressed their concern about the perceived lack of interest in the region from young people, and fear that soon enough nobody will step up to oversee them.⁷⁵⁷⁶

⁷⁵ Mike Hunninghake, "A Conservation with a Member of the Pinelands Alliance," e-mail interview by author, April 1, 2012.

⁷⁶ Eric Reed, "A Conservation with a Pinelands Resident," interview by author, October 29, 2011.

Comparable

- New York's Campaign for Parks is a special advocacy group created by Parks & Trails New York, a nonprofit aimed at meeting with people on regional, local and state levels in order to "plan, develop and promote" trails, parks and greenways throughout the state. The Campaign for Parks is comprised of numerous stakeholders whose sole mission is to petition for state and federal funding in order to improve state and local parks throughout New York. The Pinelands Commission could form a coalition like the Campaign for Parks in order to engage the community in landscape conservation and find alternative sources of revenue.⁷⁷

Methodology

- It is time for the Pinelands Commission to utilize the power of the digital age and spread as much information about the region as possible via the Internet and social networking channels. A comprehensive database would aid in garnering support for the Pinelands, and should be promoted in conjunction with a revamped advocacy campaign. The spread of knowledge about the Pinelands may very well result in the increase of visitors to the region, but that does not mean that historic sites and landscapes should be left to rot in the forest, their value only recognized by a privileged few. The Preservation Area was created for the people of New Jersey to enjoy for free and forever, and they have the right to be informed about all aspects of its importance.

⁷⁷ "Campaign for Parks," Parks & Trails New York, accessed April 10, 2012, http://www.ptny.org/advocacy/campaign_for_parks.shtml.

In just one hundred years, the iron industry changed the landscape of the Pine Barrens forever. The story of iron in the Pines is full of people, places, and moments that greatly impacted the settlement of New Jersey and the early development of the United States. While the state of New Jersey has done an adequate job of protecting the region's natural resources, the lack of a solid preservation policy and overarching framework to govern the region has led to the erosion of irreplaceable cultural resources. Increased advocacy and a public-private approach to preservation could help to mitigate the damage done to the Pinelands. Even so, the CMP and CRMP are in serious need of revision, and unless the Pinelands Commission takes immediate action to mitigate the issues that currently plague the Pines, an integral and fascinating part of history will be lost forever (Figure 6.1).



Fig. 6.1: A crumbling wall in the forest near Harrisville. Photo taken by author.

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<http://www.njaudubon.org/SectionConservation/WhyWeAreNeverFinishedSavingLand.aspx>.

APPENDIX A:
Historic Site Inventory

ATSION IRON WORKS

Site Number: 001

Historic Site Name(s): Atsion Iron Works

Current Site Name: Atsion

County: Burlington

National Register: October 22, 1974

State Register: September 11, 1970

Years in Operation: 1767-1848

Type: Intact



Samuel Richards Mansion, Atsion.



Atsion in 1849, from the Otley and Whiteford Map of Burlington County.

BATSTO FURNACE

Site Number: 002

Historic Site Name(s): Batsto Furnace

Current Site Name: Batsto

County: Burlington

National Register: September 10, 1971

State Register: September 11, 1970

Years in Operation: 1766-1865

Type: Intact



Batsto General Store.



Batsto in 1849, from the Otley and Whiteford Map of Burlington County.

BIRMINGHAM FORGE

Site Number: 003

Historic Site Name(s): Retreat Forge

Current Site Name: N/A

County: Burlington

National Register: No

State Register: No

Years in Operation: c. 1800-1820

Type: Archaeological



Unless otherwise noted, all maps found in this appendix come from C.C. Vermeule's 1886 Topographic Survey of New Jersey.

BUDD'S IRON WORKS

Site Number: 004

Historic Site Name(s): Cumberland Furnace

Current Site Name: N/A

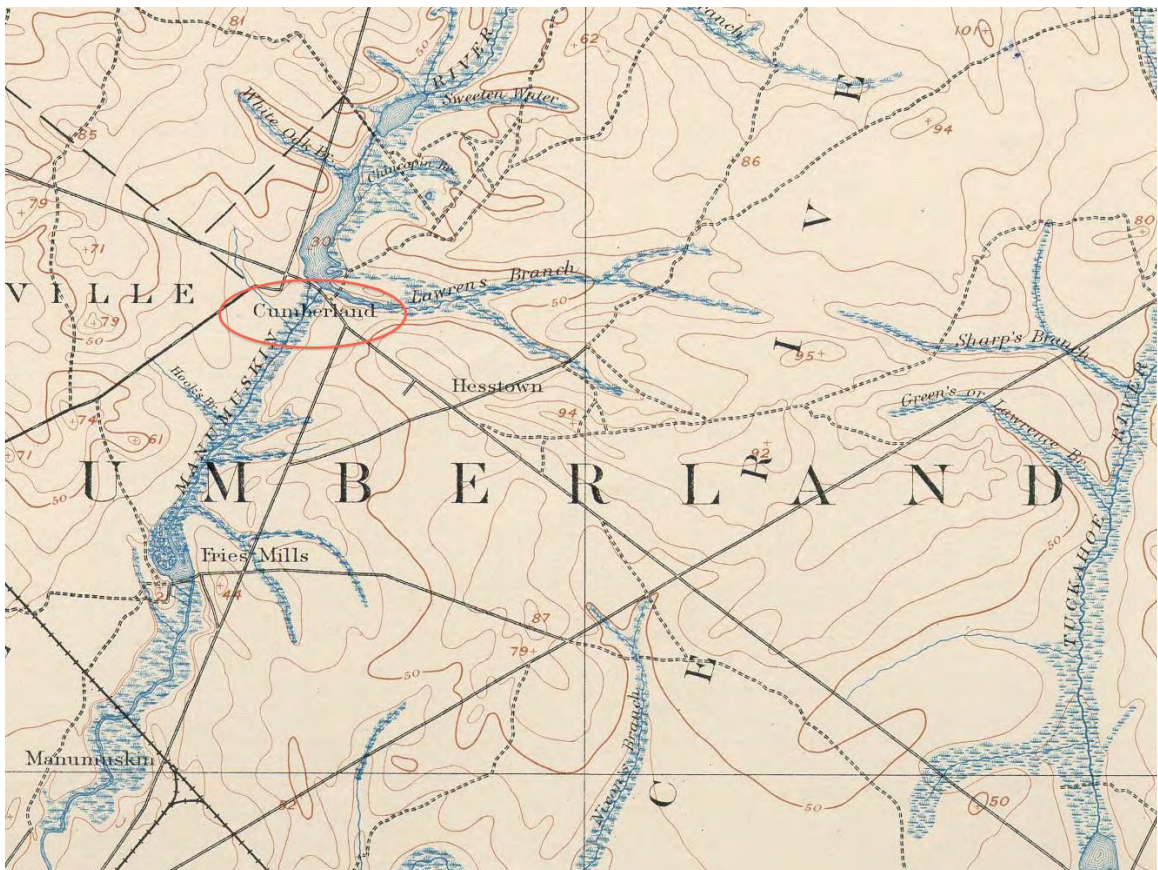
County: Cumberland

National Register: No

State Register: No

Years in Operation: c. 1810- c. 1840

Type: Ruins



BUTCHER'S FORGE

Site Number:	005	
Historic Site Name(s):	Burr's Forge	*Due in part to their age, I was unable to find maps, drawings, or photographs of the sites listed on pgs. #97-98.
Current Site Name:	N/A	
County:	Ocean	
National Register:	No	
State Register:	No	
Years in Operation:	c. 1808- c. 1845	
Type:	Area of Arch/Hist Potential	

COHANSIE IRON WORKS

Site Number:	006
Historic Site Name(s):	N/A
Current Site Name:	N/A
County:	Cumberland
National Register:	No
State Register:	No
Years in Operation:	c. 1700- c. 1776
Type:	Area of Arch/Hist Potential

DAVID WRIGHTS FORGE

Site Number:	007
Historic Site Name(s):	Federal Forge and Furnace, Manchester Furnace
Current Site Name:	N/A
County:	Ocean
National Register:	No
State Register:	No
Years in Operation:	1789-1855
Type:	Ruins

* These ruins are located on private property and could not be examined.

DOVER FORGE

Site Number: 008

Historic Site Name(s): N/A

Current Site Name: N/A

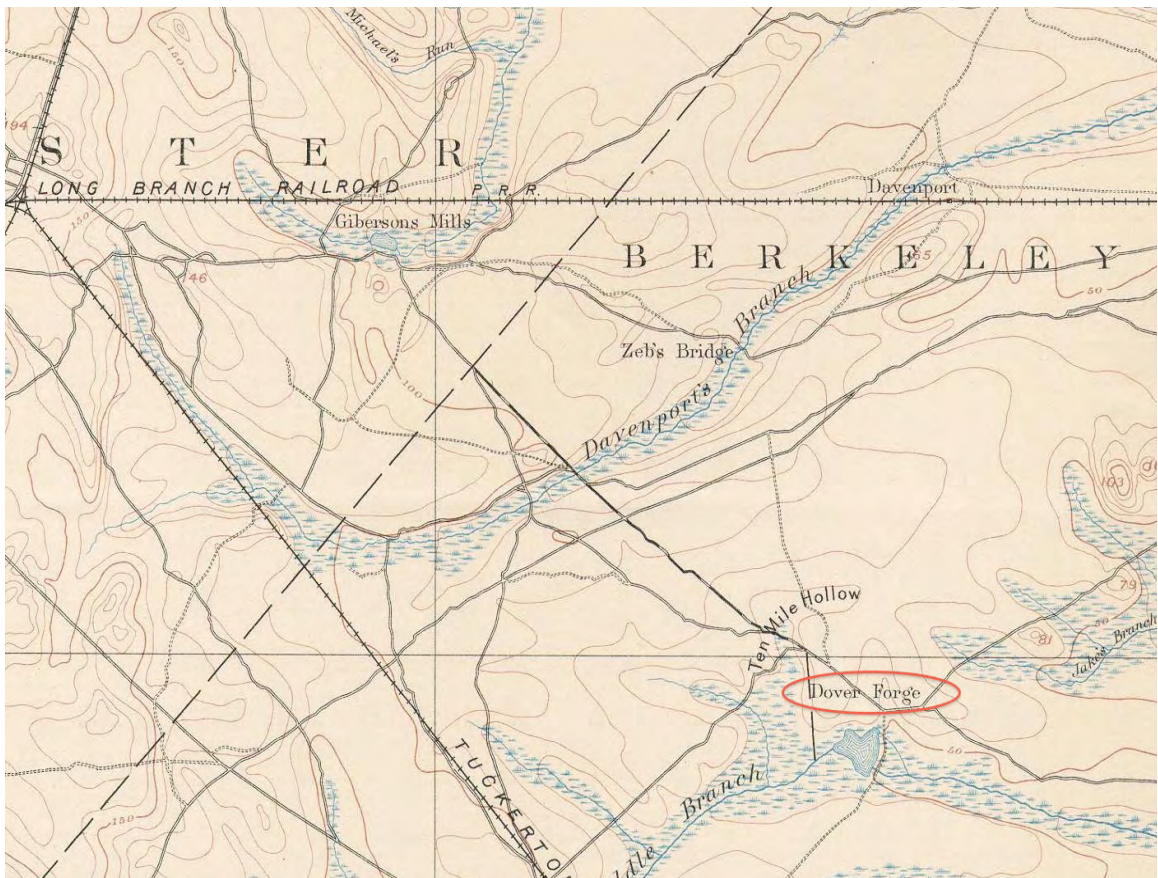
County: Ocean

National Register: No

State Register: No

Years in Operation: c. 1809- 1868

Type: Area of Arch/Hist
Potential



ETNA FURNACE

Site Number: 009

Historic Site Name(s): Aetna Furnace

Current Site Name: Medford Lakes

County: Burlington

National Register: No

State Register: No

Years in Operation: c. 1766- 1783

Type: Area of Arch/Hist
Potential



The furnace mound at Etna Furnace. Photo courtesy Kevin Hooa.

FERRAGO FORGE

Site Number: 010

Historic Site Name(s): Bamber Forge

Current Site Name: N/A

County: Ocean

National Register: No

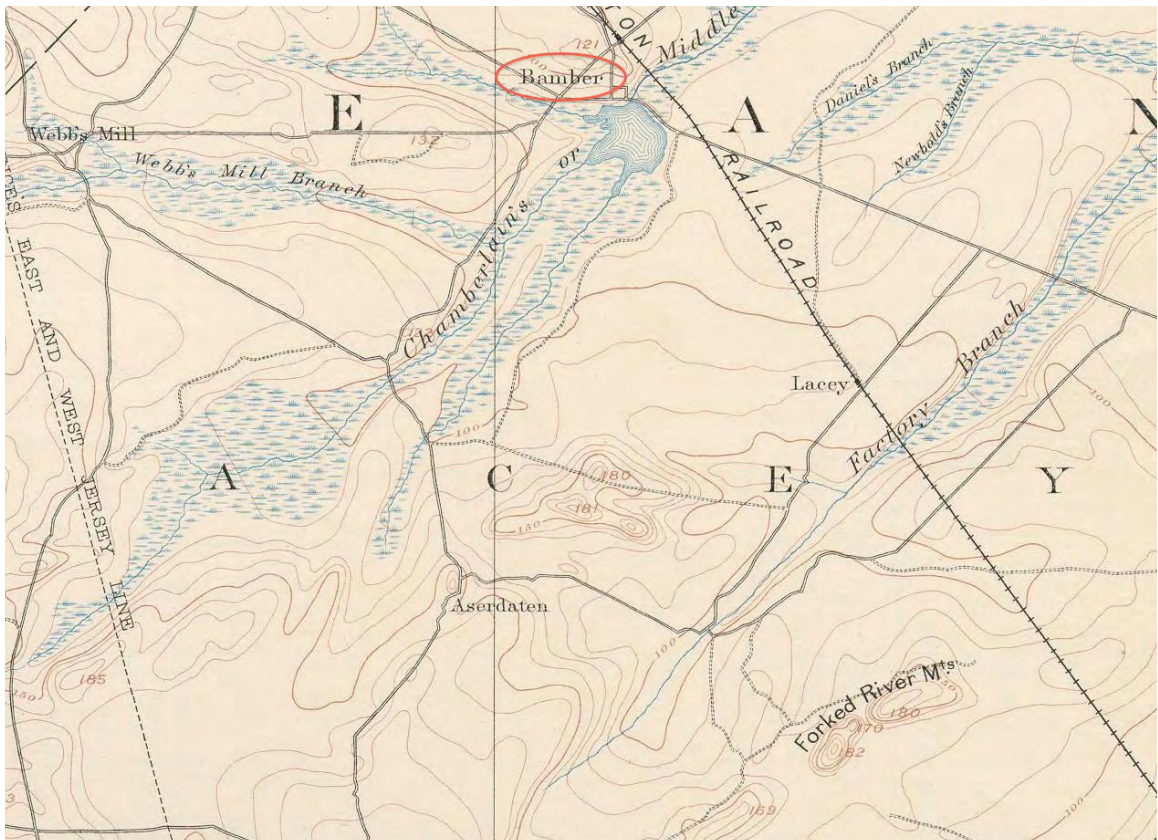
State Register: No

Years in Operation: 1811-1865

Type: Archaeological



Signage at the former Ferrago Forge site.



GLOUCESTER FURNACE

Site Number: 011

Historic Site Name(s): N/A

Current Site Name: N/A

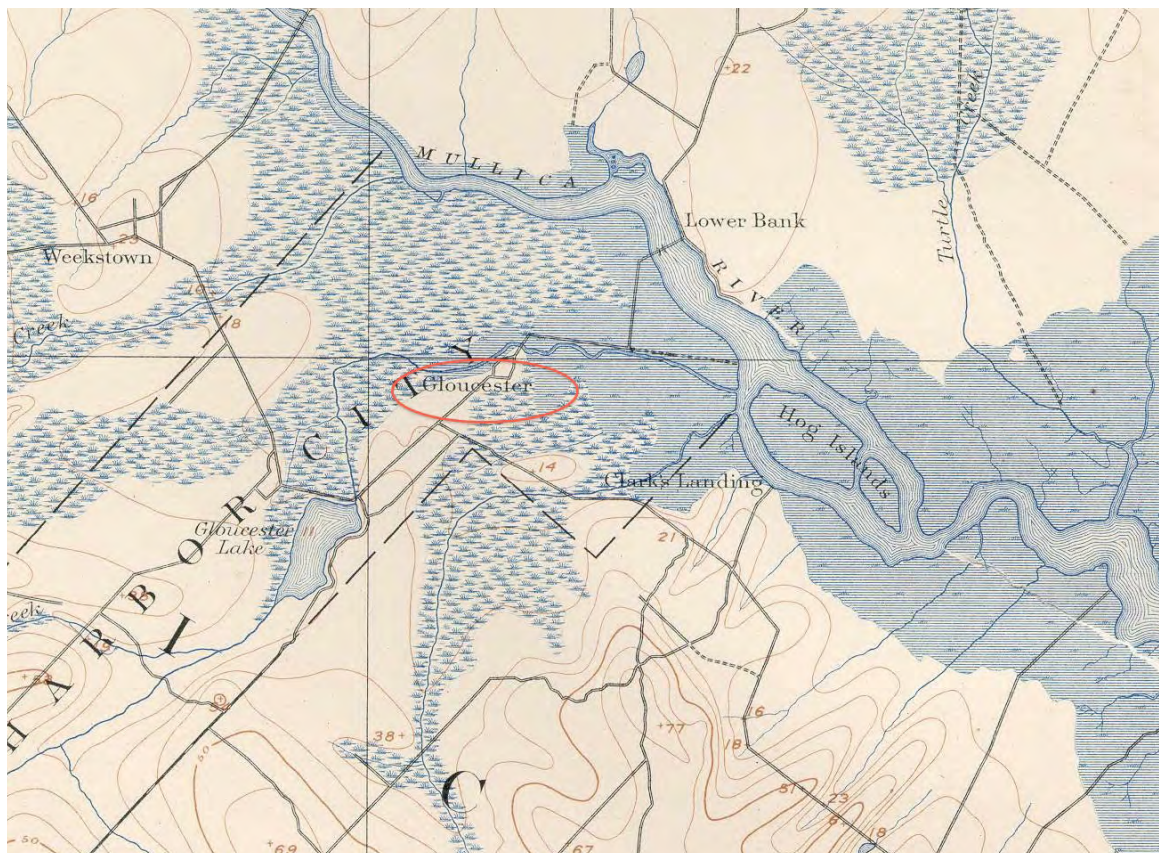
County: Atlantic

National Register: No

State Register: No

Years in Operation: 1813-1848

Type: Area of Arch/Hist
Potential



HAMPTON FURNACE

Site Number: 012

Historic Site Name(s): N/A

Current Site Name: N/A

County: Burlington

National Register: No

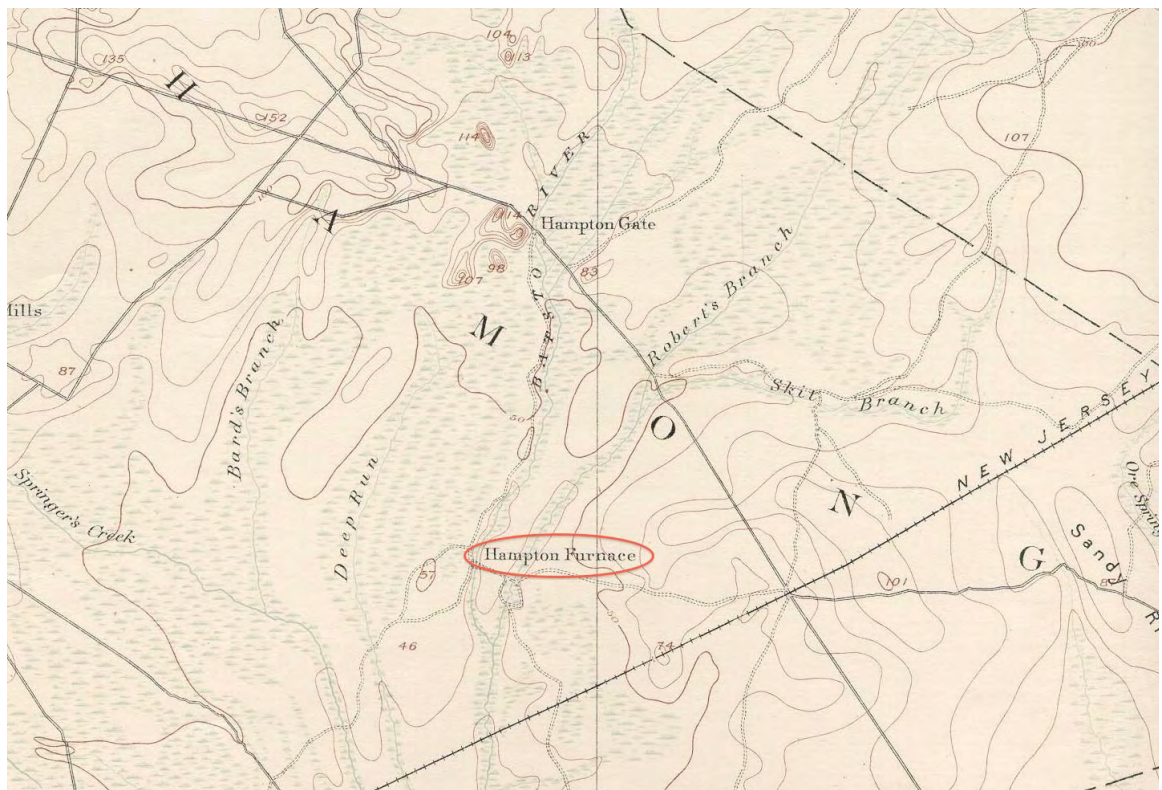
State Register: No

Years in Operation: Late 1700's- 1834

Type: Ruins

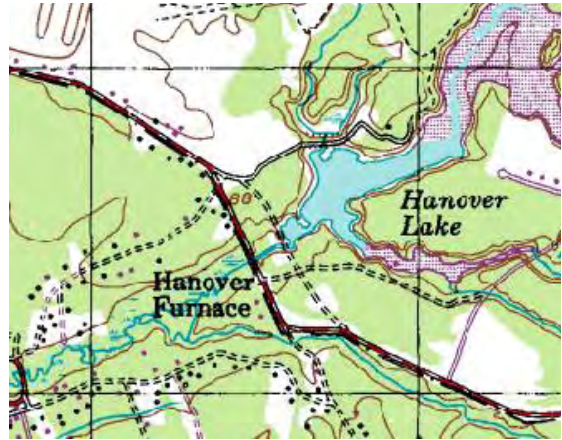


Ruins at Hampton Furnace.

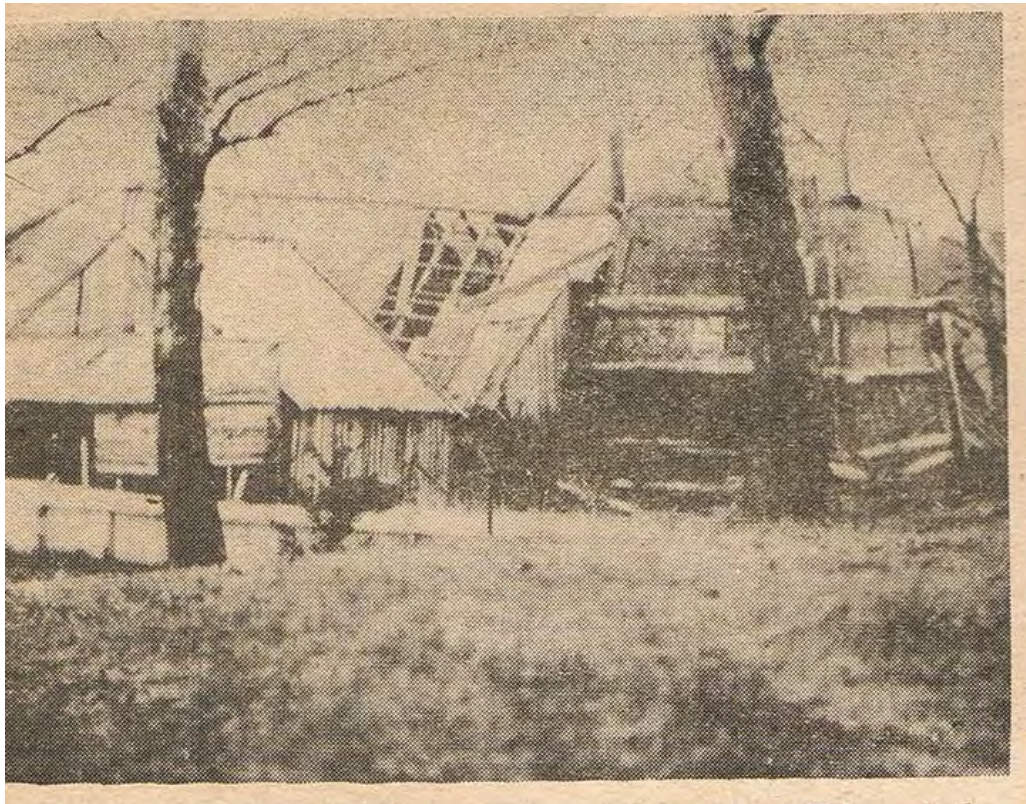


HANOVER FURNACE

Site Number: 013
Historic Site Name(s): N/A
Current Site Name: Hanover Furnace
County: Burlington
National Register: March 1, 1974
State Register: June 15, 1973
Years in Operation: 1791-1863
Type: Ruins



1954 USGS Topographic
Survey of New Jersey.



Hanover Furnace in 1875. Photo courtesy NJ historian John Antrim.

LISBON FORGE

Site Number: 014

Historic Site Name(s): New Lisbon Forge

Current Site Name: N/A

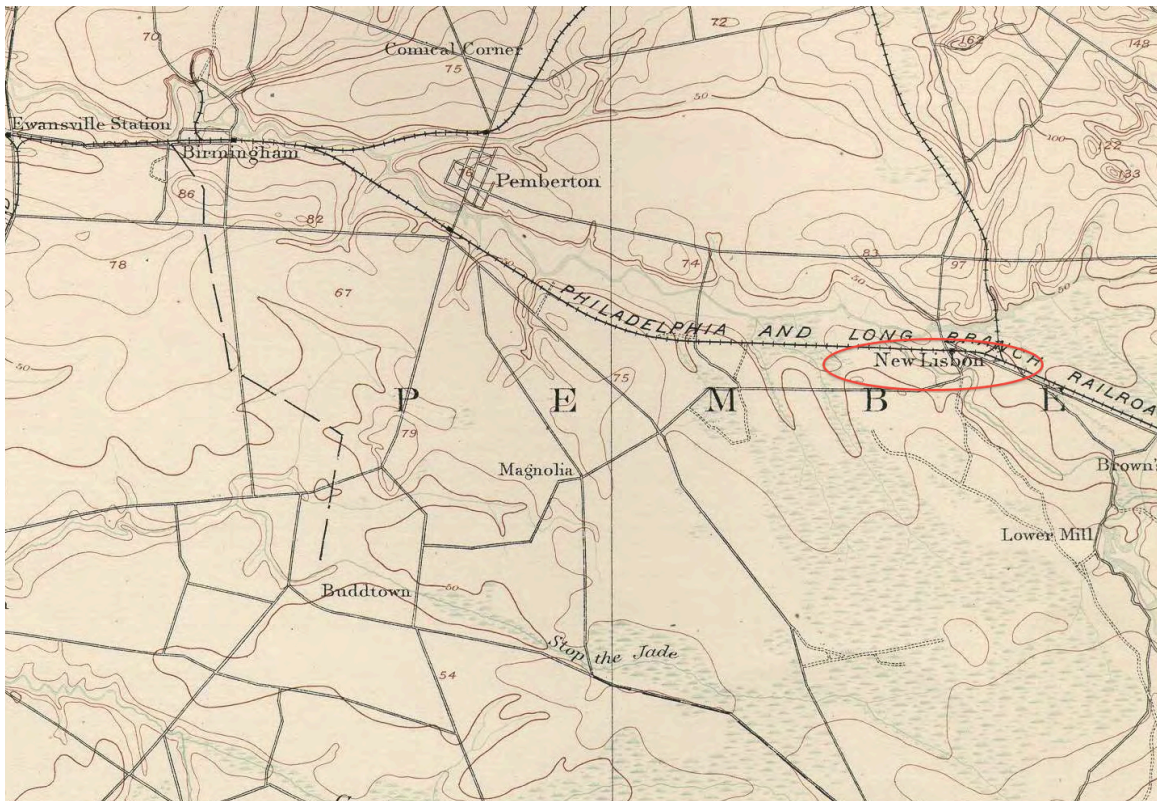
County: Burlington

National Register: No

State Register: No

Years in Operation: 1800-1828

Type: Ruins



LOWER FORGE

Site Number: 015

Historic Site Name(s): Phoenix Forge

Current Site Name: N/A

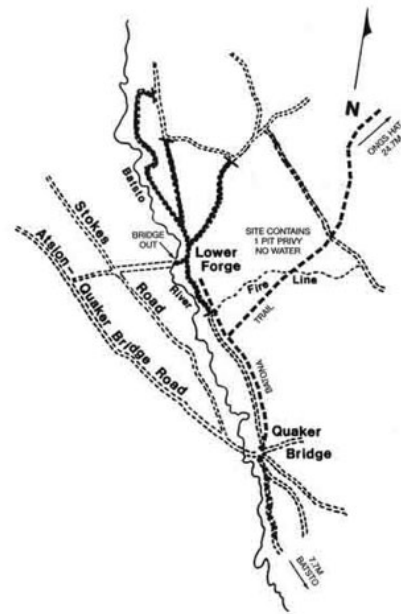
County: Ocean

National Register: No

State Register: No

Years in Operation: ?- Ruins by 1855

Type: Area of Arch/Hist Potential



Lower Forge Map courtesy the NJ Department of Parks and Forestry.



Lower Forge Campground in Wharton State Forest.

MARTHA FURNACE

Site Number: 016
Historic Site Name(s): N/A
Current Site Name: N/A
County: Burlington
National Register: No
State Register: No
Years in Operation: 1793-1848
Type: Archaeological



Martha during the excavation.
Photo courtesy of Bass River
Township



The mound at Martha Furnace.

MARY ANN FORGE

Site Number: 017

Historic Site Name(s): N/A

Current Site Name: N/A

County: Ocean

National Register: No

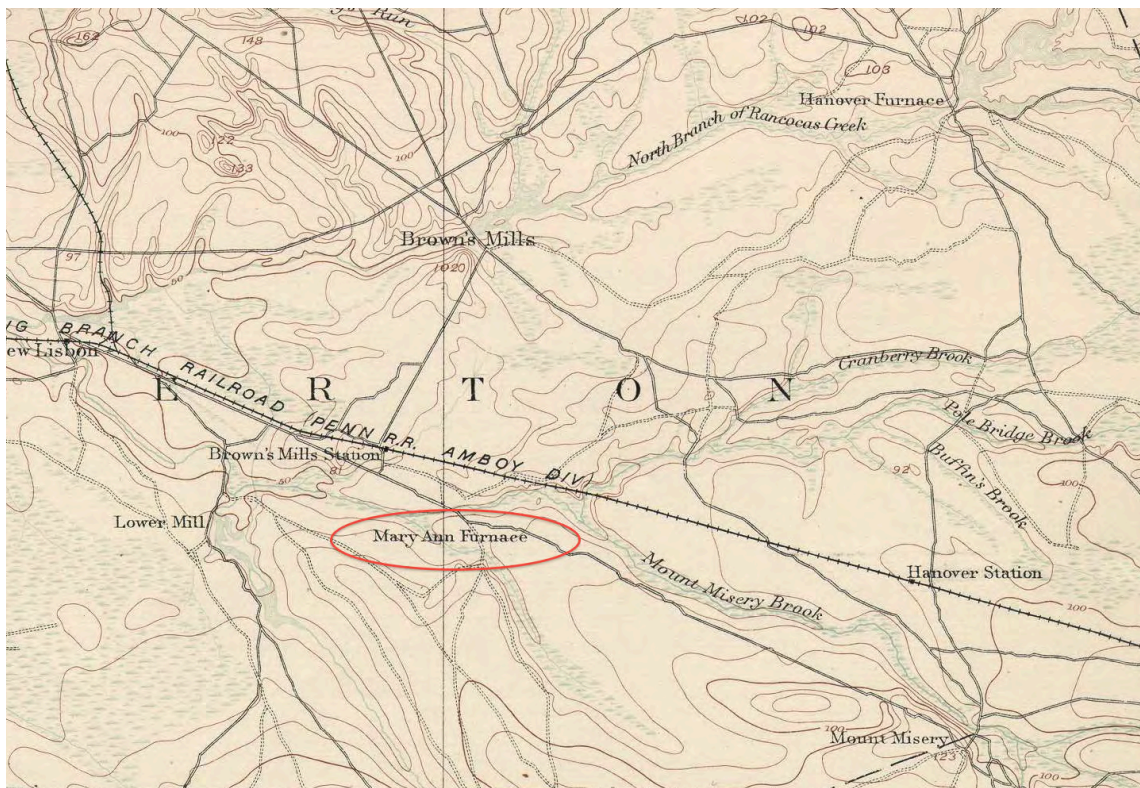
State Register: No

Years in Operation: c. 1820- 1840's

Type: Ruins



1849 Map of Burlington County by
A.W. Otley and E. Whiteford



MILLVILLE FURNACE AND FOUNDRY

Site Number: 018

Historic Site Name(s): N/A

Current Site Name: N/A

County: Cumberland

National Register: No

State Register: No

Years in Operation: c. 1803-1865

Type: Area of Arch/Hist
Significance



David Cooper Wood House, Millville, NJ David Cooper Wood and his brother Richard Davis Wood founded Millville Furnace around 1803. Photo courtesy of Wawa, Inc.

MONROE FORGE

Site Number: 019

Historic Site Name(s): Walkers Forge

Current Site Name: N/A

County: Atlantic

National Register: No

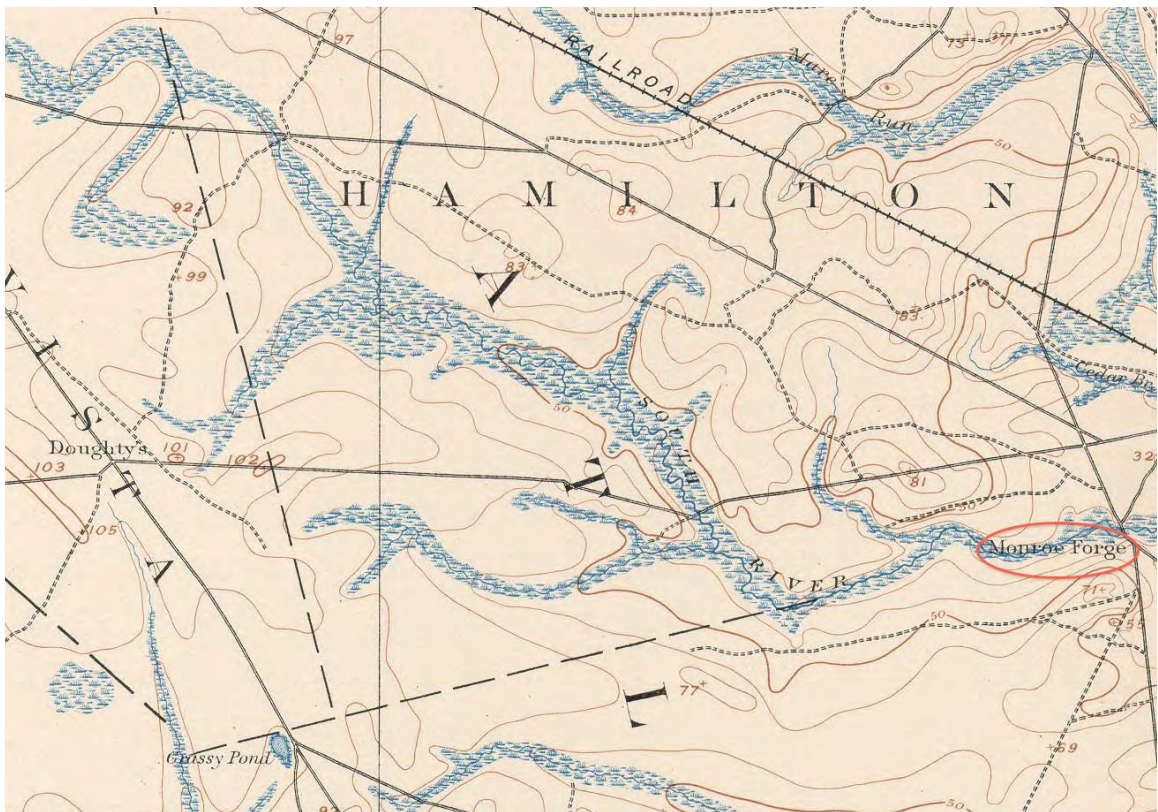
State Register: No

Years in Operation: 1820-1853

Type: Archaeological



Raceway at Monroe Forge.



MOUNT HOLLY IRON WORKS

Site Number: 020

Historic Site Name(s): N/A

Current Site Name: N/A

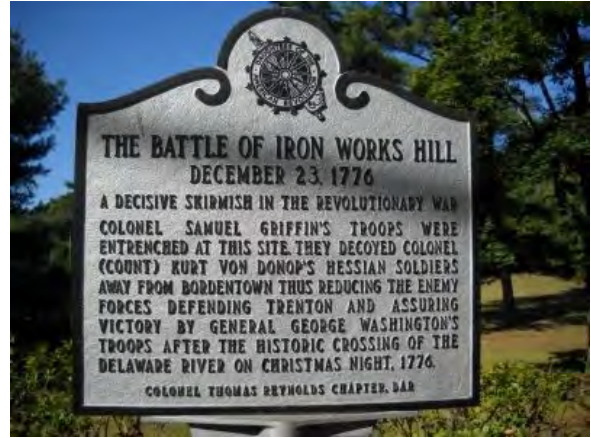
County: Burlington

National Register: No

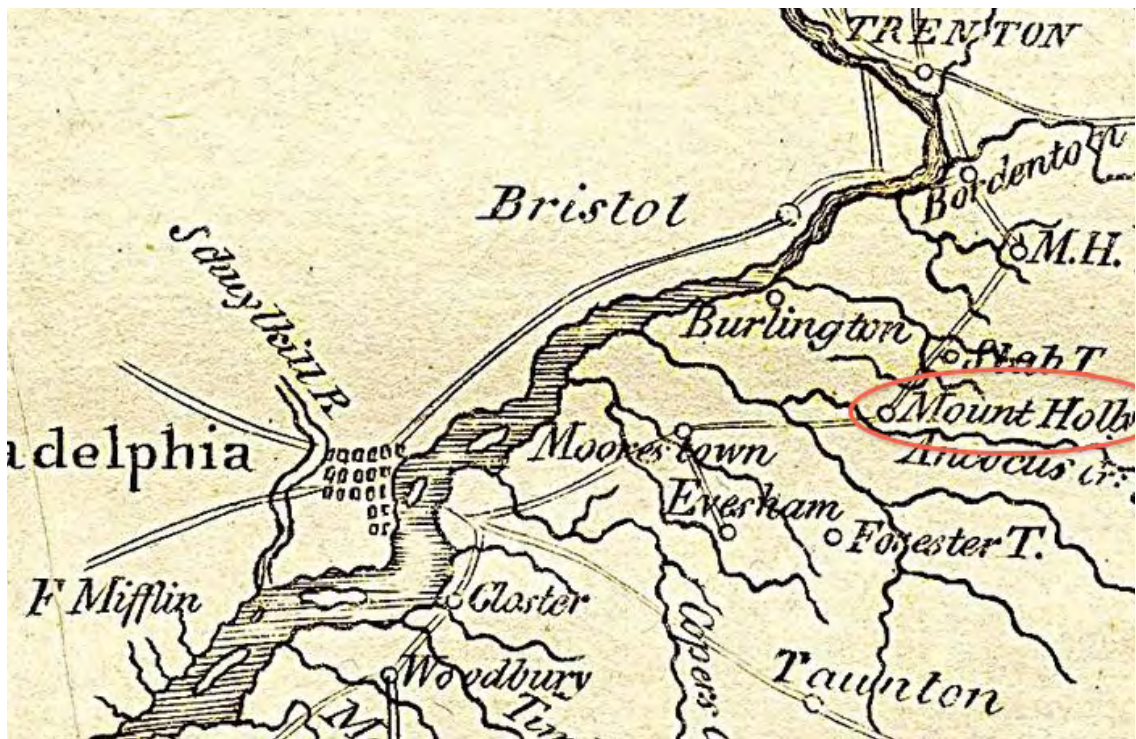
State Register: No

Years in Operation: 1730- June 1788

Type: Ruins



Signage at the site of Mount Holly Iron Works.



1806 Map of New Jersey by Mathew Carey.

NEW MILLS FORGE

Site Number: 021

Historic Site Name(s): Pemberton Forge

Current Site Name: N/A

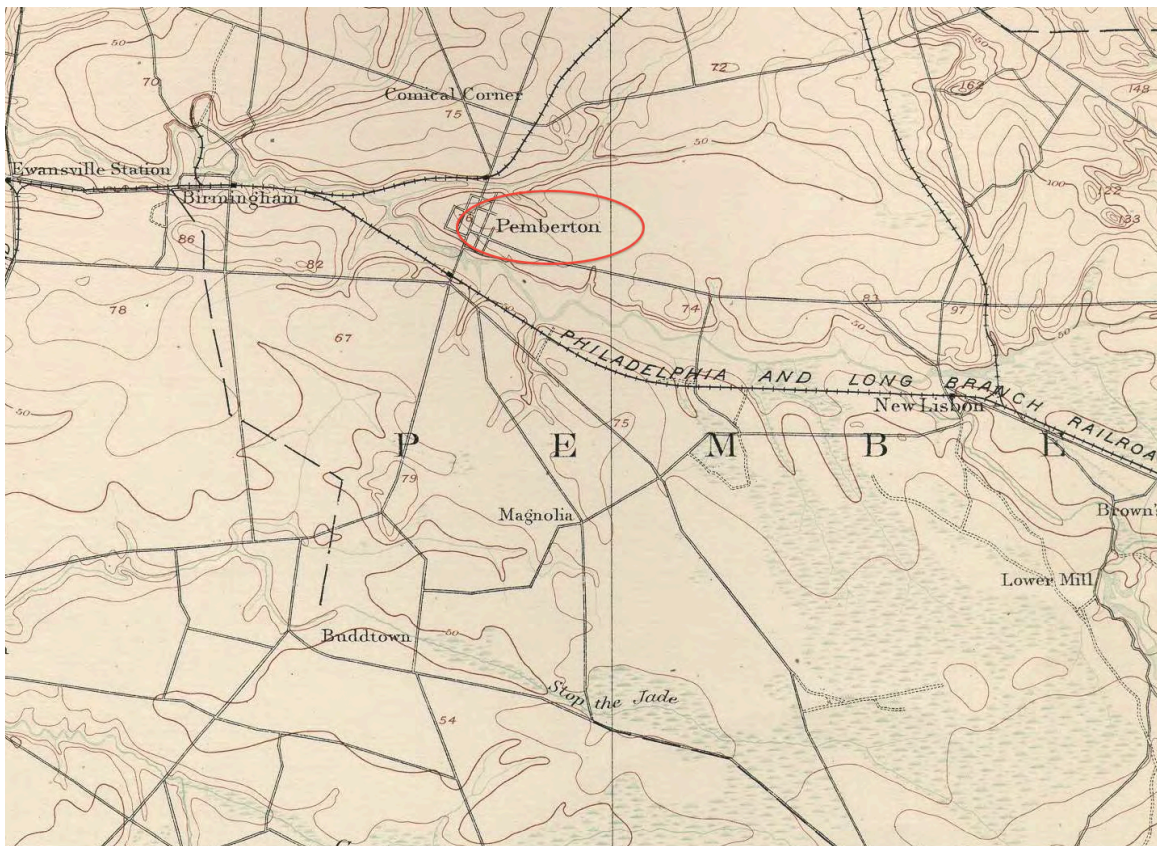
County: Burlington

National Register: No

State Register: No

Years in Operation: 1781-1811

Type: Ruins



SPEEDWELL FURNACE

Site Number: 022

Historic Site Name(s): N/A

Current Site Name: N/A

County: Burlington

National Register: No

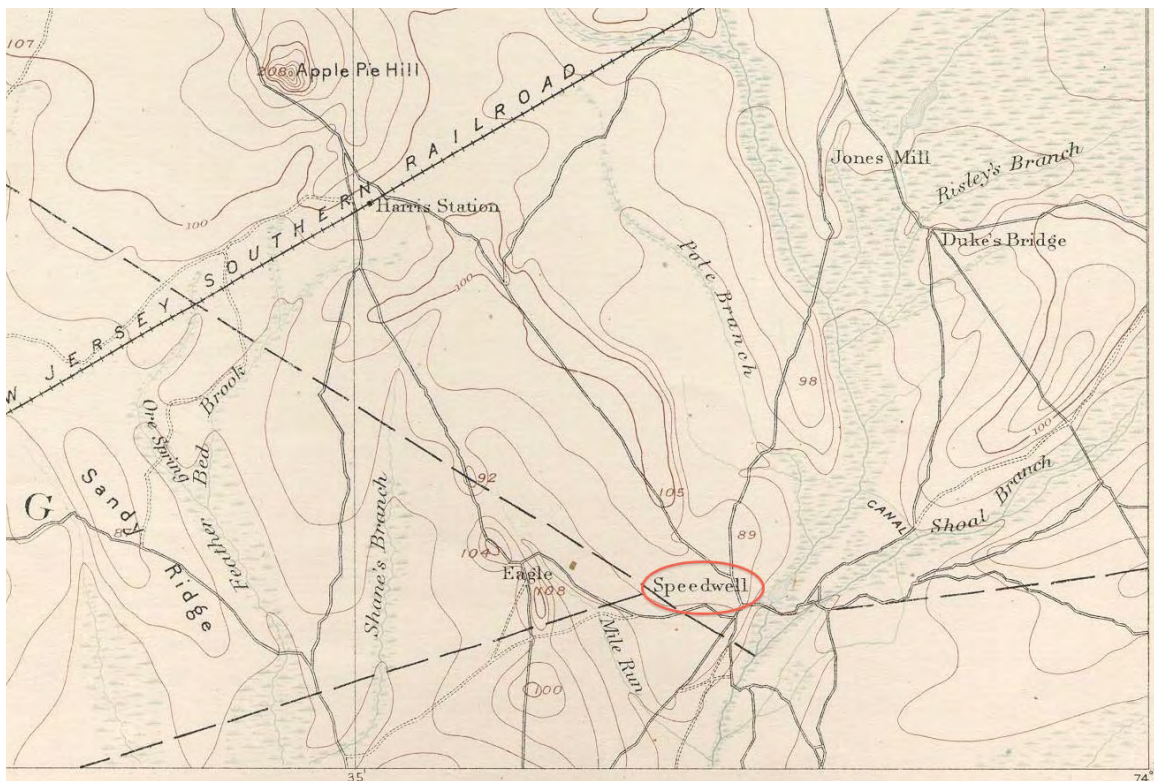
State Register: No

Years in Operation: 1783-1850

Type: Ruins



Ruins at Speedwell Furnace.



TAUNTON FURNACE AND FORGE

Site Number: 023

Historic Site Name(s): Tanton, Tintern

Current Site Name: N/A

County: Burlington

National Register: No

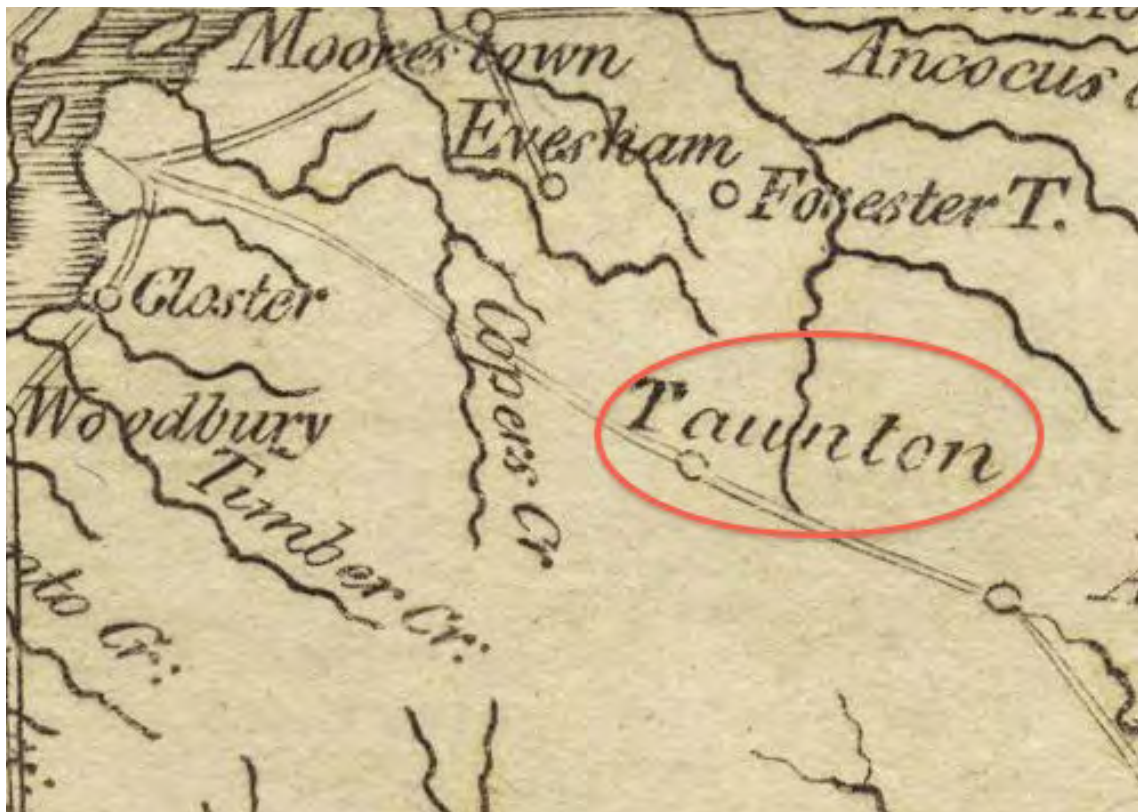
State Register: No

Years in Operation: c. 1768-1830

Type: Archaeological



Signage at the site of Taunton Furnace.



1806 Map of New Jersey by Mathew Carey.

WADING RIVER FORGE

Site Number: 024

Historic Site Name(s): N/A

Current Site Name: N/A

County: Burlington

National Register: No

State Register: No

Years in Operation: c. 1807-1835

Type: Area of Arch/Hist
Potential



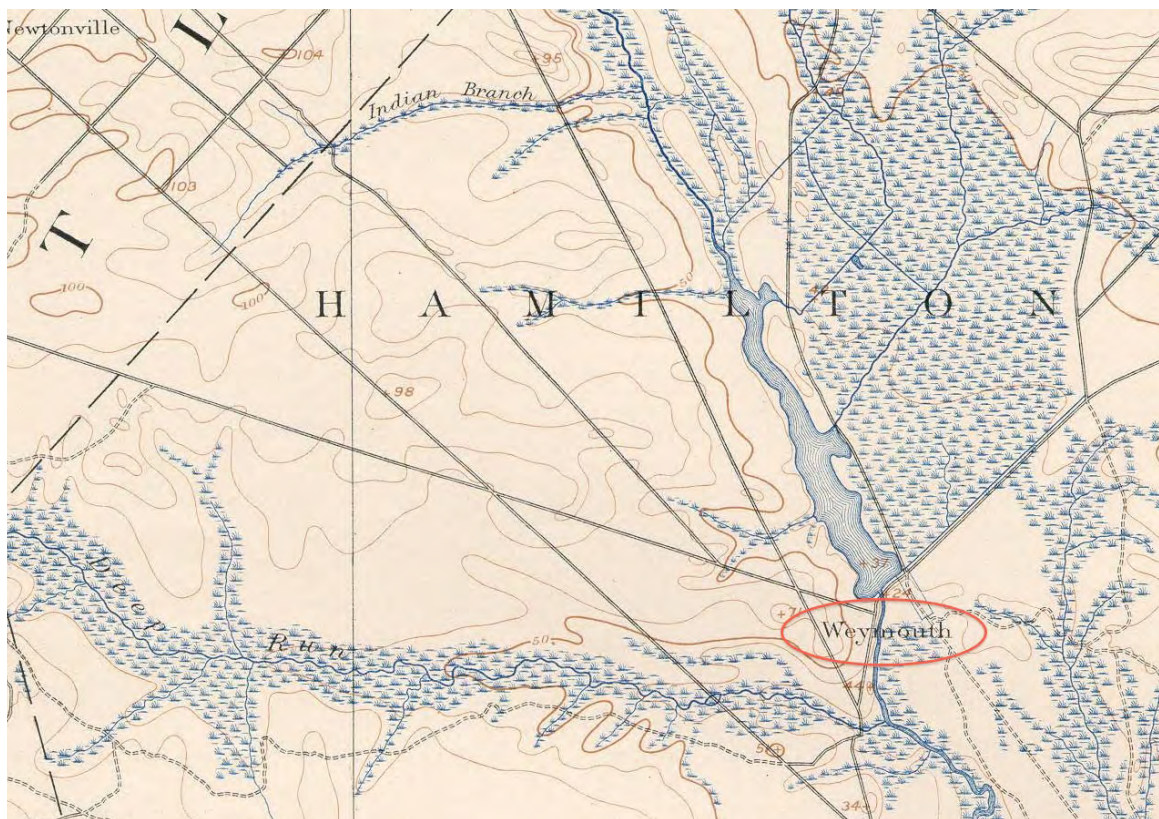
Rubble found at Wading River Forge.

WEYMOUTH FURNACE

Site Number: 025
Historic Site Name(s): N/A
Current Site Name: N/A
County: Atlantic
National Register: No
State Register: No



Years in Operation: c. 1800-1865
Type: Ruins
Ruins at Weymouth Furnace.



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